



# 50TFQ004-012

## Single Package Rooftop Heat Pump Units

# Wiring Diagrams

## DIAGRAM INDEX

### DIAGRAM INDEX

UNIT LABEL DIAGRAM				
Unit 50TFQ	Voltage-Phase-Hertz	Type	Label Diagram	Figure No.
004,005	208/230-1-60	Schematic/Component Arrangement	50DK508797	1
	208/230-3-60	Schematic/Component Arrangement	50DK508798	2
	460-3-60	Schematic/Component Arrangement	50DK508801	3
	575-3-60	Schematic/Component Arrangement	50DK508804	4
006	208/230-1-60	Schematic/Component Arrangement	50DK508797	1
	208/230-3-60	Schematic/Component Arrangement	50DK508779	5
	460-3-60	Schematic/Component Arrangement	50DK508802	6
	575-3-60	Schematic/Component Arrangement	50DK508805	7
007	208/230-3-60	Schematic/Component Arrangement	50DK508800	8
	460-3-60	Schematic/Component Arrangement	50DK508803	9
	575-3-60	Schematic/Component Arrangement	50DK508806	10
008-012	208/230-3-60	Schematic/Component Arrangement	50DK508808	11
	460-3-60	Schematic/Component Arrangement	50DK508809	12
	575-3-60	Schematic/Component Arrangement	50DK508810	13













ELECTRIC HEATING				
Unit (Voltage-Phase)	Unit Size	Electric Heater	Label Diagram	Figure No.
208/230-1	004-006	ALL	3-05531	14
230/230-3	004-007	ALL	3-05607	15
	008-012	18.0/24.0	3-05626	16
	008-012	7.8/10.4, 12.0/16.0	3-05623	17
		24.0/32.0, 31.8/42.4	3-05626	16
	012	37.6/50.0	3-05626	
460-3	004-007	ALL	3-05536	18
	008,009	13.9	3-05624	19
	009-012	16.5	3-05624	
		27.8, 33.0, 41.7	3-05625	20
	012	50.0	3-05625	
575-3	008-012	17.0	3-05624	19
		34.0	3-05625	20
	012	51.0	3-05625	

ACCESSORY WIRING		
Description	Unit Size	Figure No.
Motormaster® I Wiring Details	004-012	21
Motormaster II Control Wiring Schematic	004-007	22
	008-012	23
Time Guard® II Device	004-012	24
Solid-State Enthalpy Control	004-012	25
Differential Enthalpy Control	004-012	26
Economi\$er Wiring	004-007	27
Economi\$er Sensor Wiring	004-012	28
Economi\$er Power Exhaust Wiring	004-012	29
Enthalpy Control and Durablade Control Board Wiring	004-012	30

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

## LEGEND

<b>AHA</b>	— Adjustable Heat Anticipator
<b>AWG</b>	— American Wire Gage
<b>C</b>	— Contactor, Compressor
<b>CAP.</b>	— Capacitor
<b>CB</b>	— Circuit Breaker
<b>CC</b>	— Cooling Capacitor
<b>CH</b>	— Crankcase Heater
<b>COMP</b>	— Compressor Motor
<b>D</b>	— Diode
<b>DB</b>	— Defrost Board
<b>DFT</b>	— Defrost Thermostat
<b>EC</b>	— Enthalpy Control
<b>ECON</b>	— Economizer
<b>EPS</b>	— Emergency Power Supply (Nine-Volt Battery)
<b>EQUIP</b>	— Equipment
<b>ER</b>	— Economizer Relay
<b>FPT</b>	— Freeze-Up Protection Thermostat
<b>FSS</b>	— Filter Status Switch
<b>FU</b>	— Fuse
<b>GND</b>	— Ground
<b>HC</b>	— Heater Contactor (Strip Heat)
<b>HP</b>	— Heat Pump
<b>HPS</b>	— High-Pressure Switch
<b>HR</b>	— Heater Relay
<b>IFC</b>	— Indoor-Fan Contactor
<b>IFM</b>	— Indoor-Fan Motor
<b>IFMOVL</b>	— Indoor-Fan Motor Overload
<b>LPS</b>	— Low-Pressure Switch
<b>LSM</b>	— Limit Switch (Manual Reset)
<b>MCA</b>	— Minimum Circuit Amps
<b>MTR</b>	— Motor
<b>OAT</b>	— Outdoor-Air Thermostat
<b>OFC</b>	— Outdoor-Fan Contactor
<b>OFM</b>	— Outdoor-Fan Motor
<b>OLR</b>	— Overload Relay

<b>P</b>	— Plug
<b>PL</b>	— Plug Assembly
<b>QT</b>	— Quadruple Terminal
<b>R</b>	— Relay
<b>RVS</b>	— Reversing Valve Solenoid
<b>SAT</b>	— Supply-Air Thermostat
<b>ST</b>	— Start Thermistor
<b>SW1</b>	— Switch Fully Open
<b>SW2</b>	— Switch Fully Closed
<b>SW3</b>	— Switch Minimum Vent Position
<b>SW4</b>	— Switch Maximum Vent Position
<b>TB</b>	— Terminal Block
<b>TC</b>	— Thermostat, Cooling
<b>TDR</b>	— Time Delay Relay
<b>TH</b>	— Thermostat, Heating
<b>TRAN</b>	— Transformer
	Field Splice
	Marked Wire
	Terminal (Marked)
	Terminal (Unmarked)
	Terminal Block
	Splice
	Splice (Marked)
	Factory Wiring
	Field Control Wiring
	Field Power Wiring
	Accessory or Optional Wiring
	To indicate common potential only. Not to represent wiring.

### NOTES FOR FIG. 1

1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. Thermostat:  
HH07AT170, 172, 174, and P272-2783.  
Subbase:  
HH93AZ176, 178 and P272-1882, 1883.
3. Set heat anticipator at .8 amp for 1st stage and .3 amp for 2nd stage.
4. Use copper conductors only.

5. Use copper, copper-clad aluminum or aluminum conductors.
- 6.

VOLTAGE RATING	CB	MUST TRIP AMPS
	MFG. PT. NO.	
24 V	Potter & Brumfield	3.2
	W2BX-1024-3.2	

### NOTES FOR FIG. 2, 8, 11, 12, 13

1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. Three-phase motors are protected under primary single phasing conditions.
3. Thermostat:  
HH07AT170, 172, 174, and P272-2783.  
Subbase:  
HH93AZ176, 178, and P272-1882, 1883.
4. Set heat anticipator at .8 amp for 1st stage and .3 amp for 2nd stage.

5. Use copper conductors only.
6. Use copper, copper-clad aluminum or aluminum conductors.
- 7.

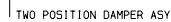
VOLTAGE RATING	CB	MUST TRIP AMPS
	MFG. PT. NO.	
24 V	Potter & Brumfield	3.2
	W2BX-1024-3.2	

### NOTES FOR FIG. 3, 4, 5, 6, 7, 9, 10

1. If any of the original wire furnished must be replaced, it must be replaced with Type 90 C wire or its equivalent.
2. Thermostat:  
HH07AT170, 172, 174, and P272-2783  
Subbase:  
HH93AZ176, 178, and P272-1882, 1883.
3. Three-phase motors are protected under primary single-phasing conditions.
4. Set heat anticipator at .8 amp for 1st stage and .3 amp for 2nd stage.
5. Use copper conductors only.

6.

VOLTAGE RATING	CB	MUST TRIP AMPS
	MFG. PT. NO.	
24 V	Potter & Brumfield	3.2
	W2BX-1024-3.2	



4

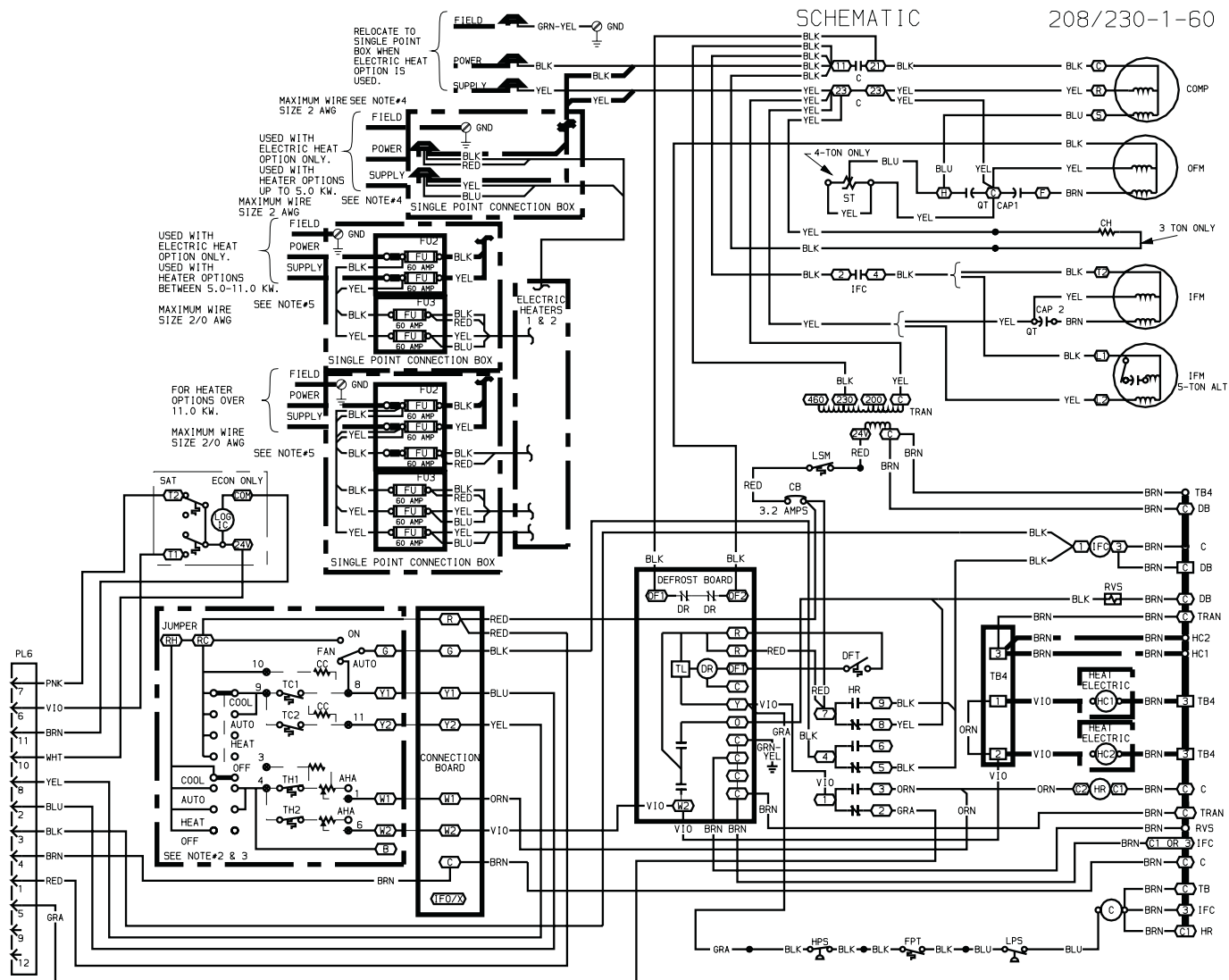
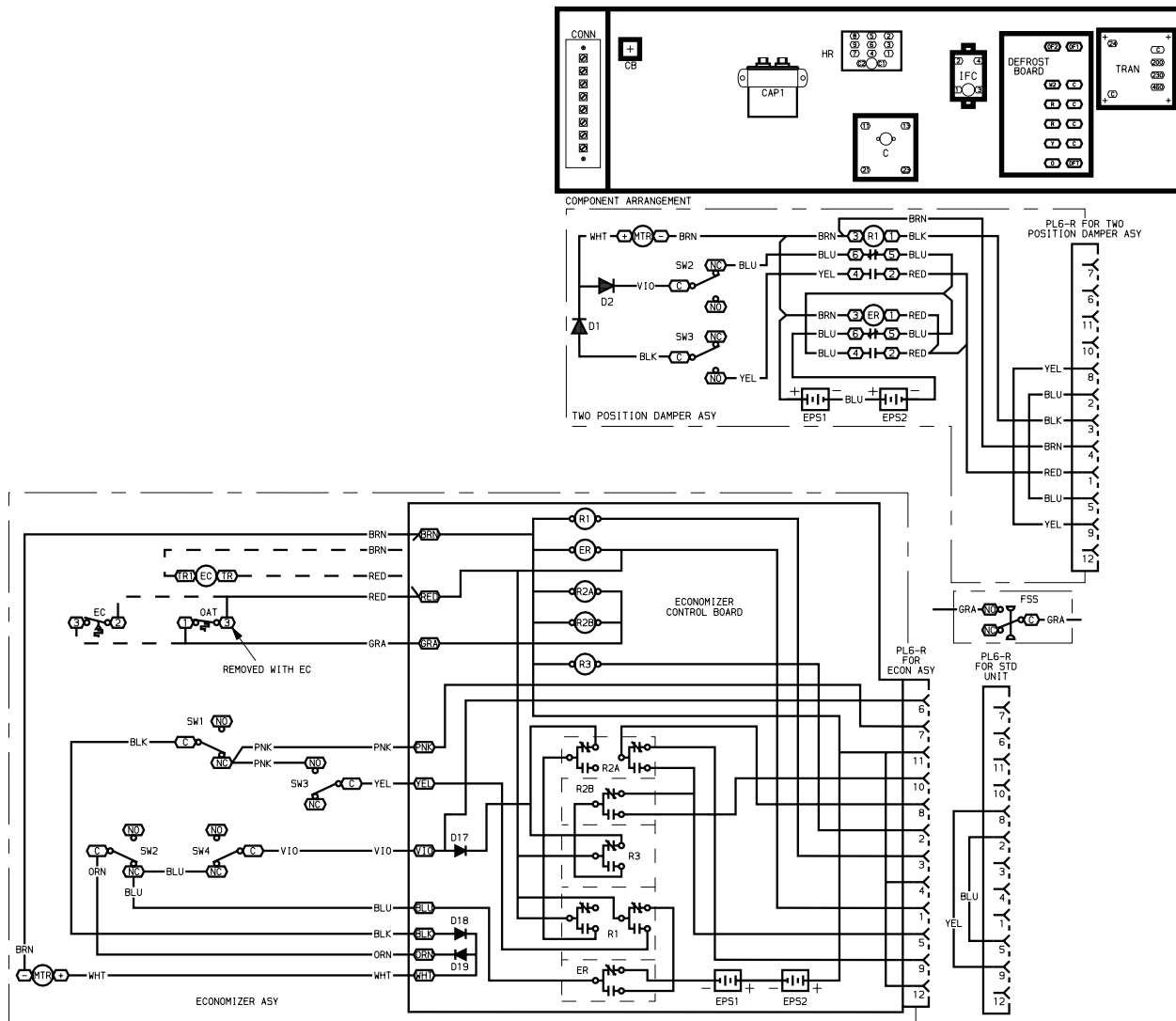
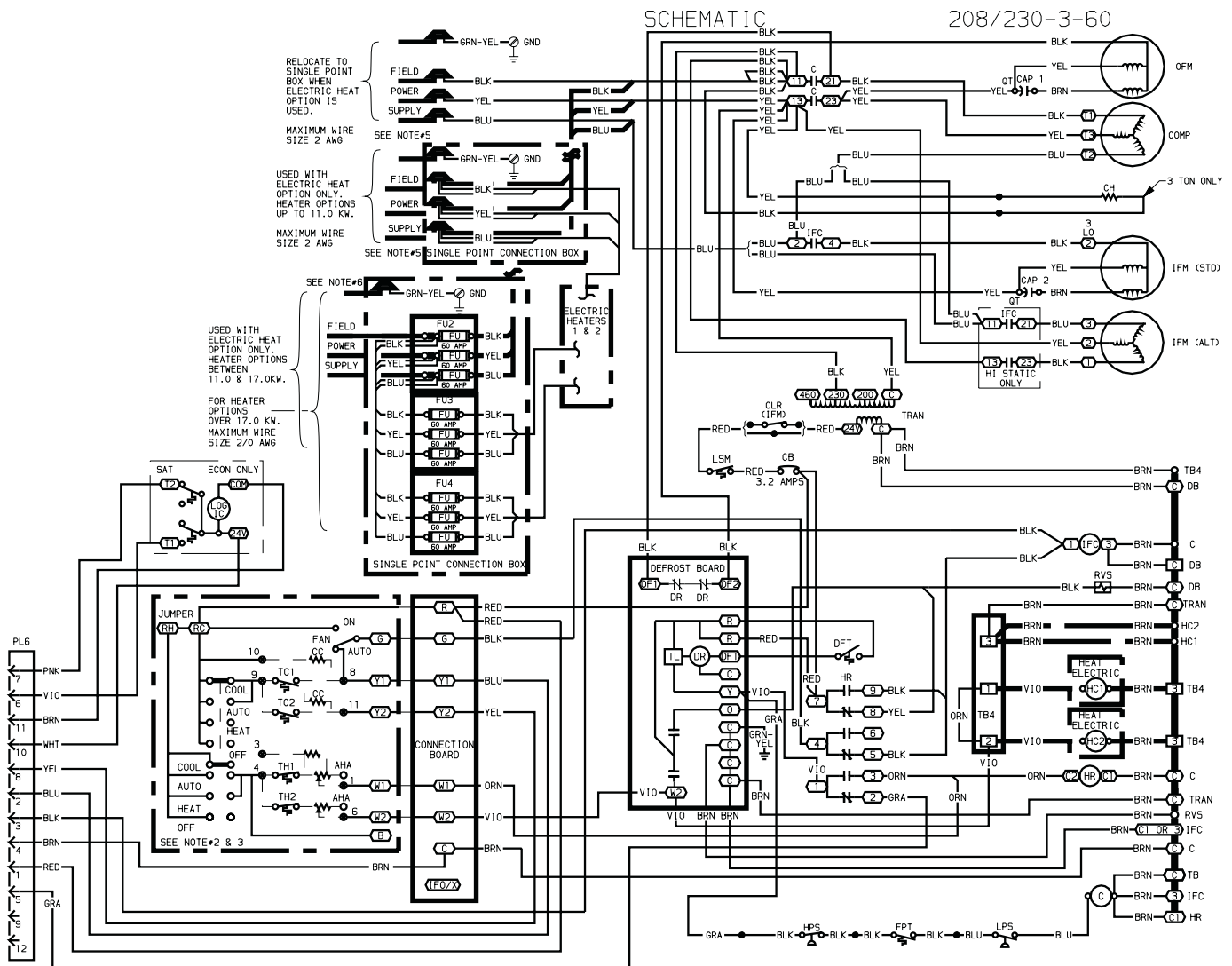


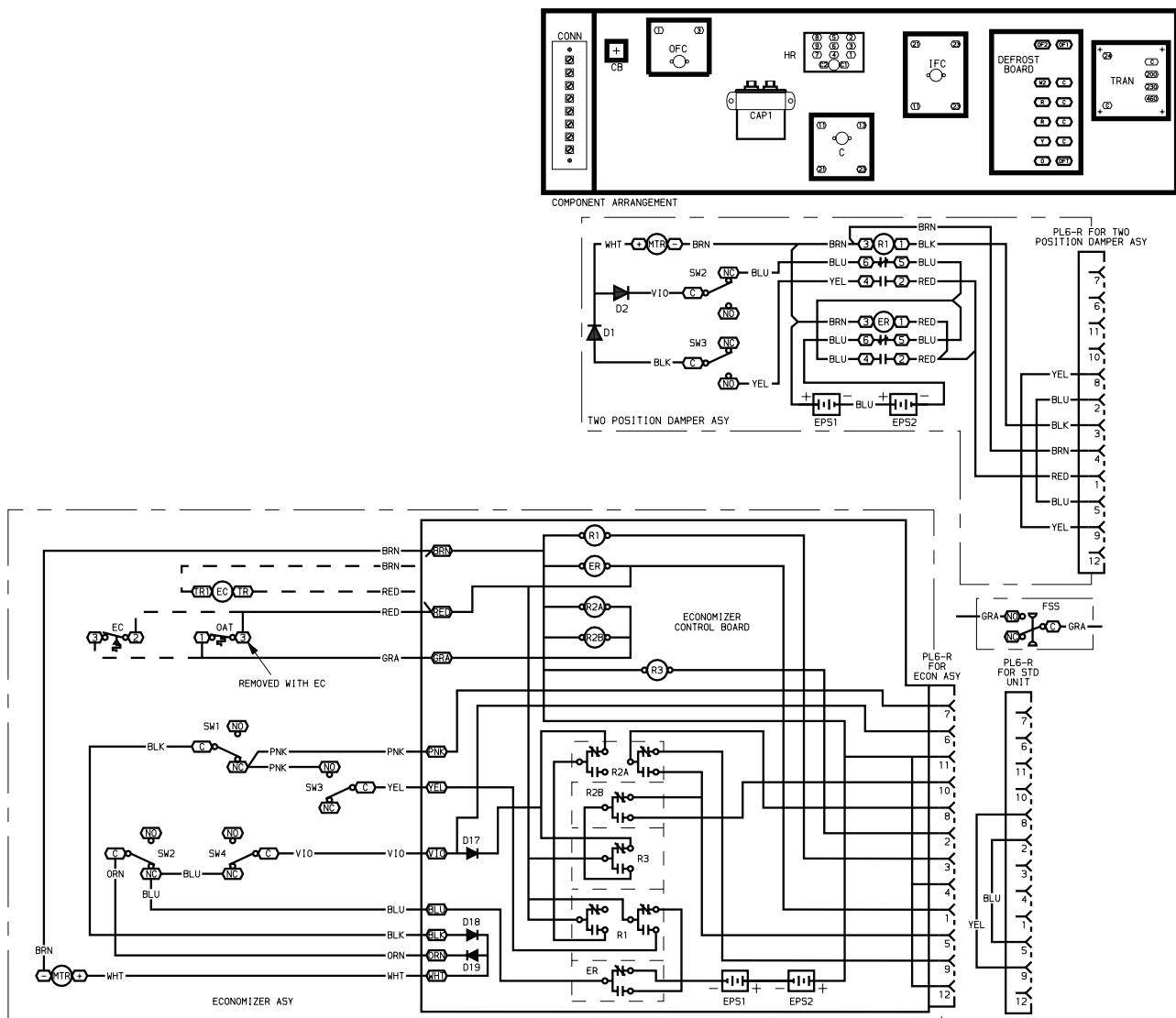
Fig. 1 — Schematic/Component Arrangement; 50TFQ004-006; 208/230-1-60 (cont)



**Fig. 2 — Schematic/Component Arrangement; 50TFQ004,005; 208/230-3-60**



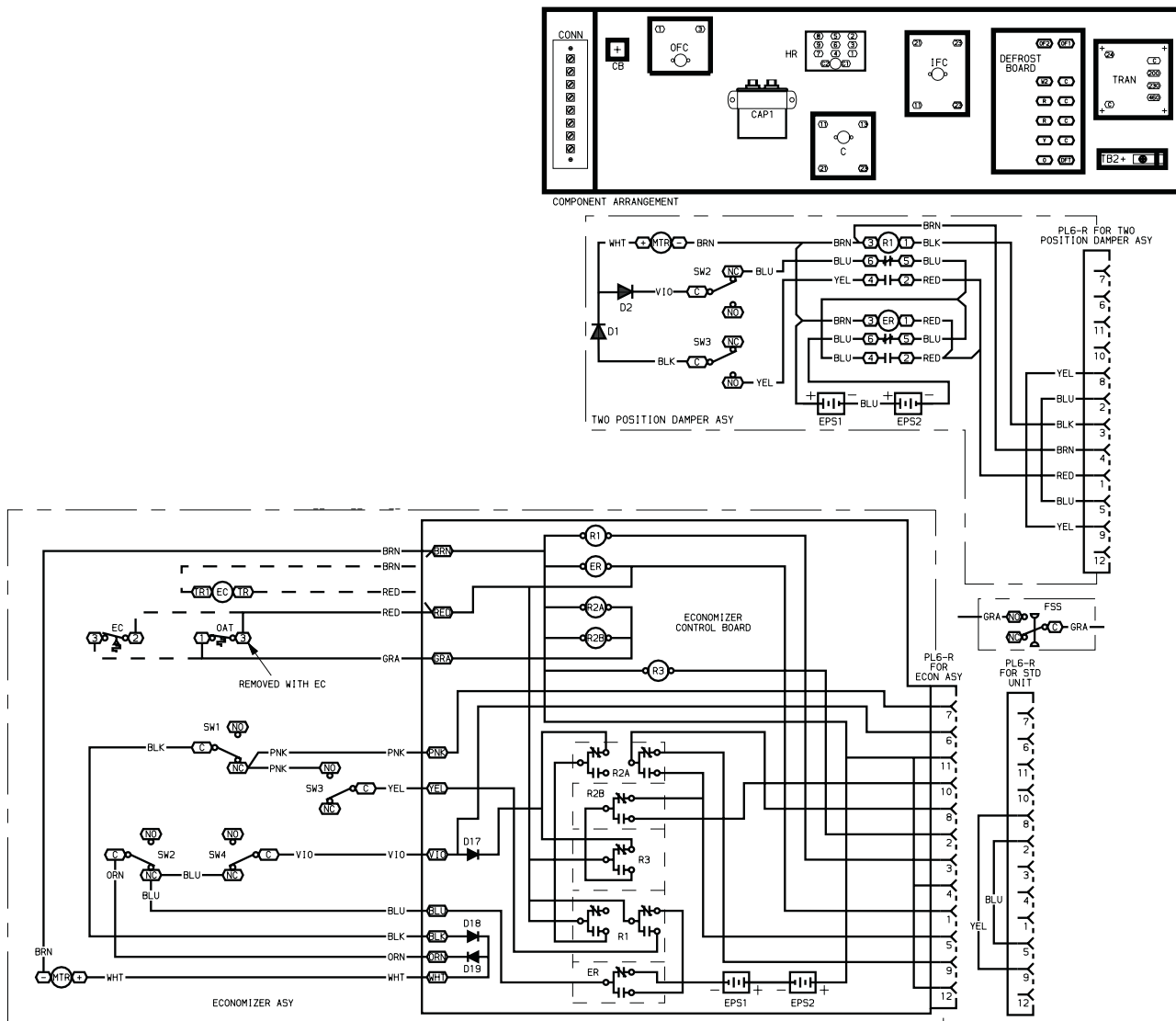
**Fig. 2 — Schematic/Component Arrangement; 50TFQ004,005; 208/230-3-60 (cont)**



**Fig. 3 — Schematic/Component Arrangement; 50TFQ004,005; 460-3-60**

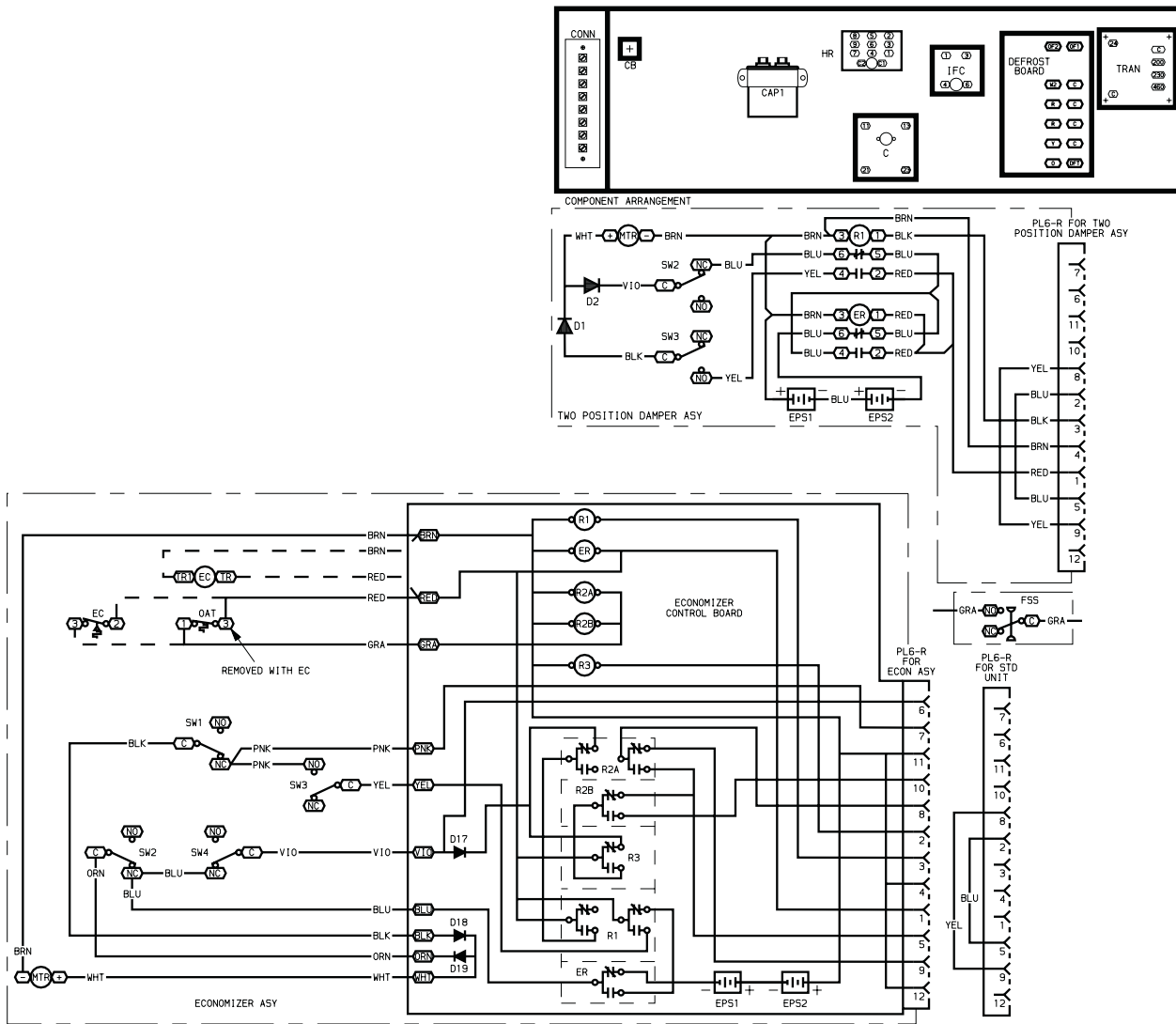






**Fig. 4 — Schematic/Component Arrangement; 50TFQ004,005; 575-3-60**





**Fig. 5 — Schematic/Component Arrangement; 50TFQ006; 208/230-3-60**

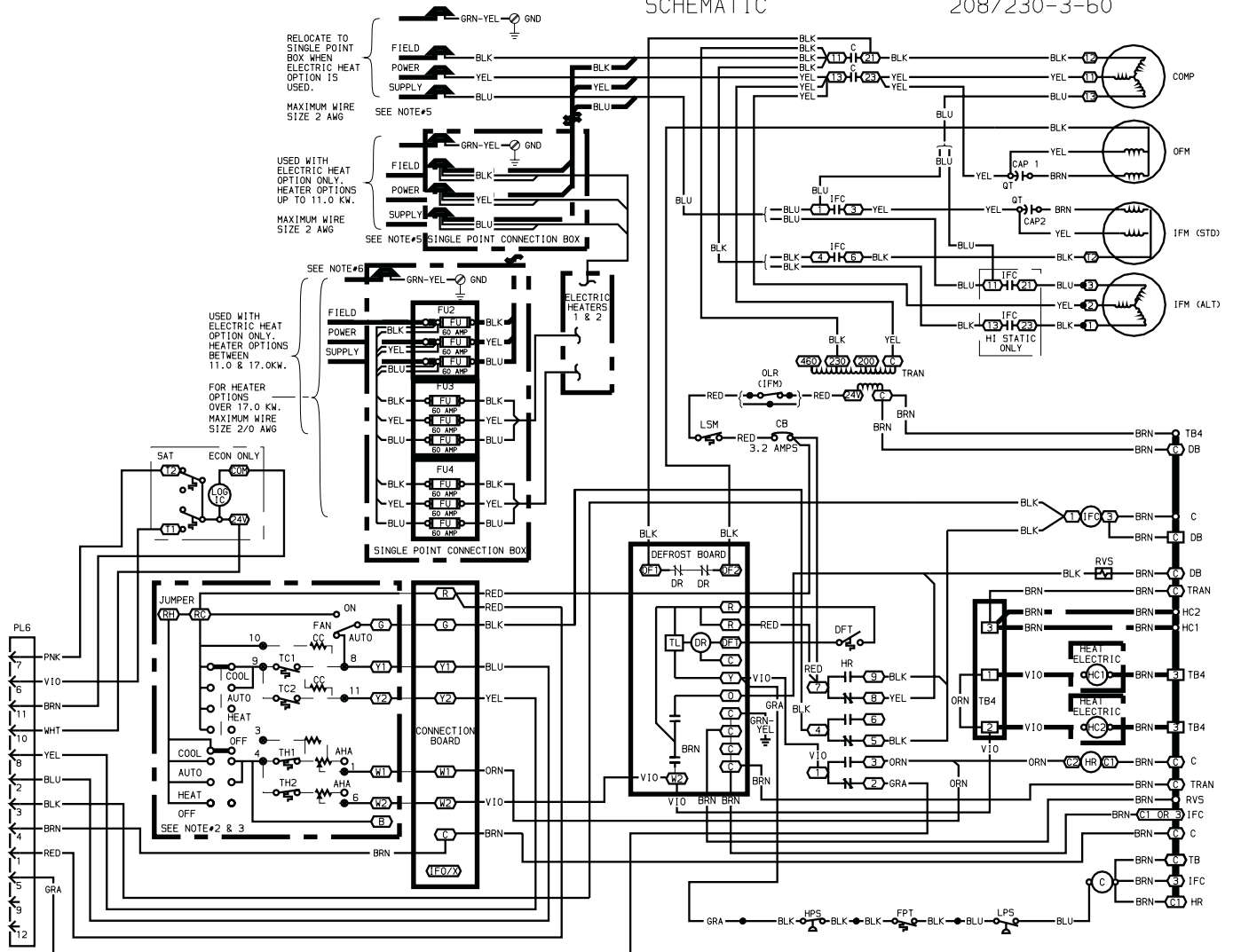
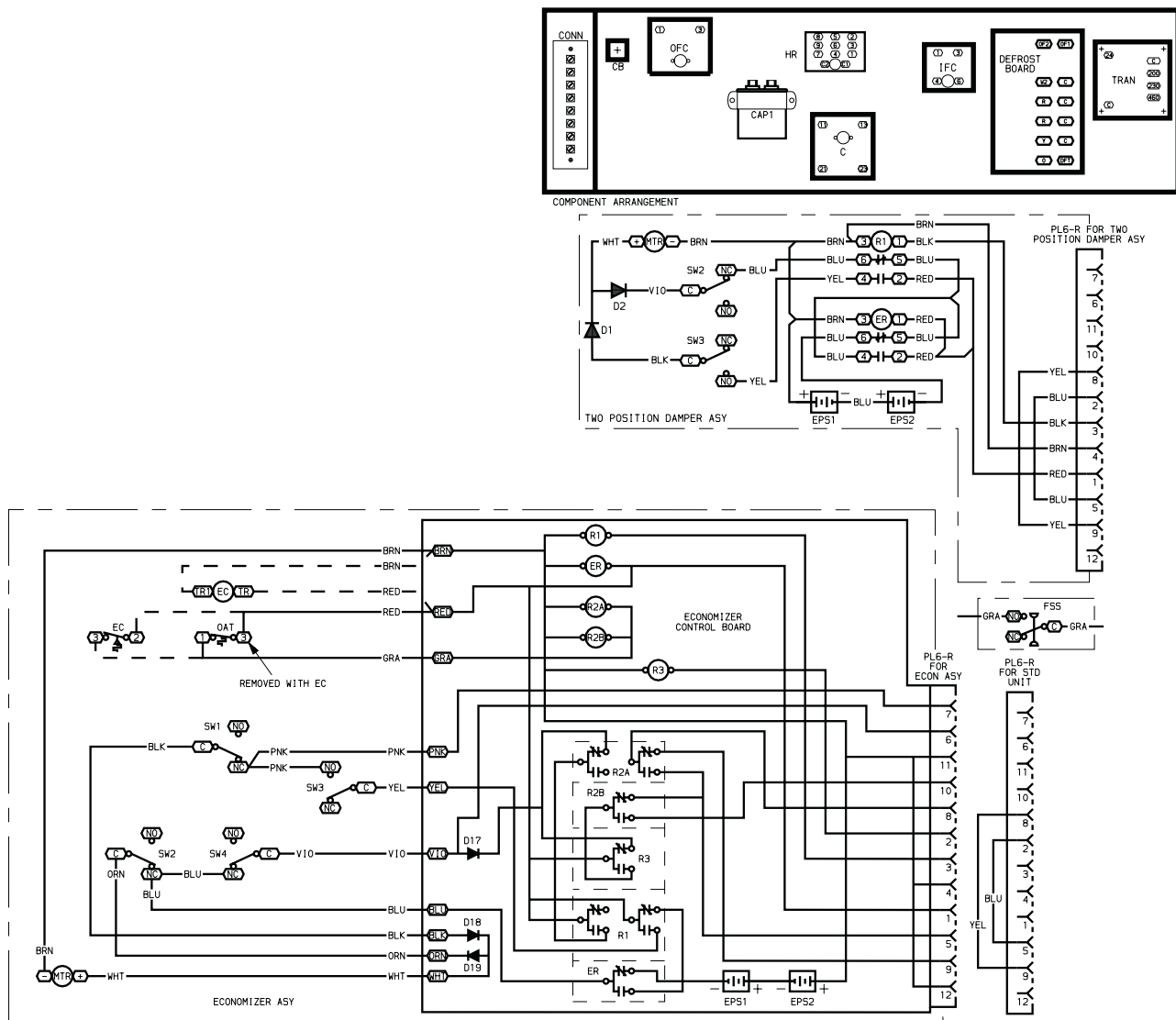


Fig. 5 — Schematic/Component Arrangement; 50TFQ006; 208/230-3-60 (cont)



**Fig. 6 — Schematic/Component Arrangement; 50TFQ006; 460-3-60**

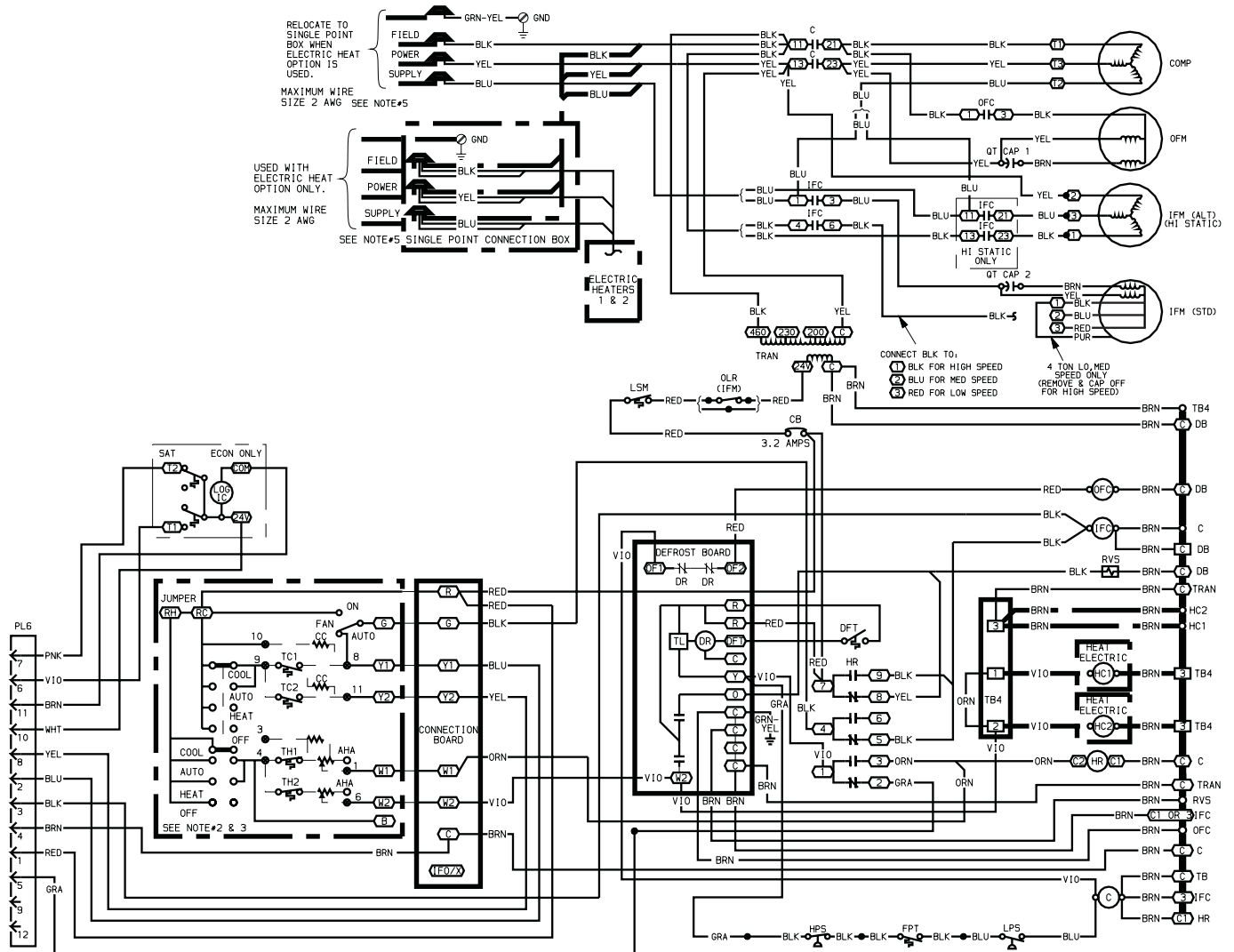
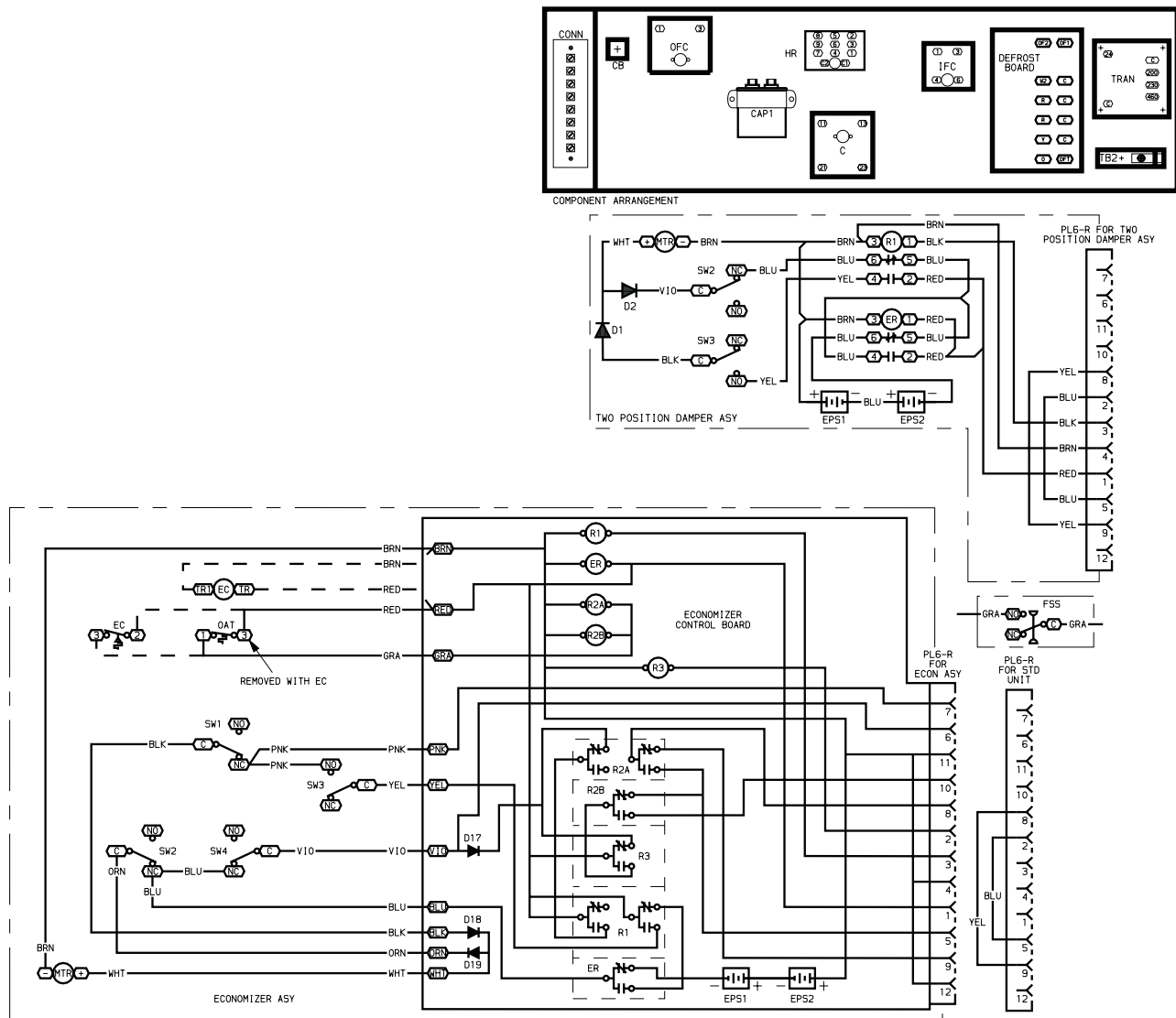


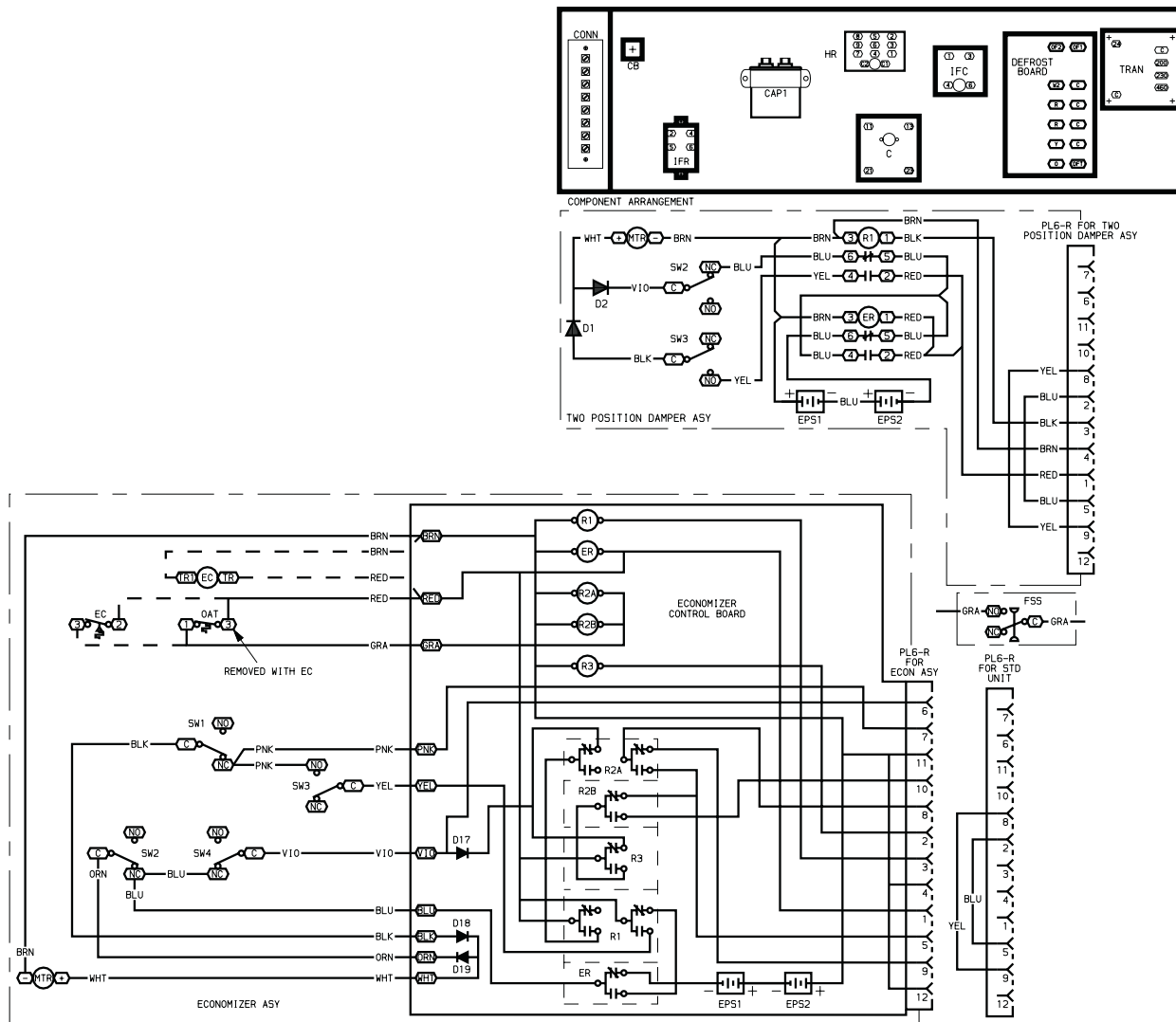
Fig. 6 — Schematic/Component Arrangement; 50TFQ006; 460-3-60 (cont)



**Fig. 7 — Schematic/Component Arrangement; 50TFQ006; 575-3-60**







**Fig. 8 — Schematic/Component Arrangement; 50TFQ007; 208/230-3-60**

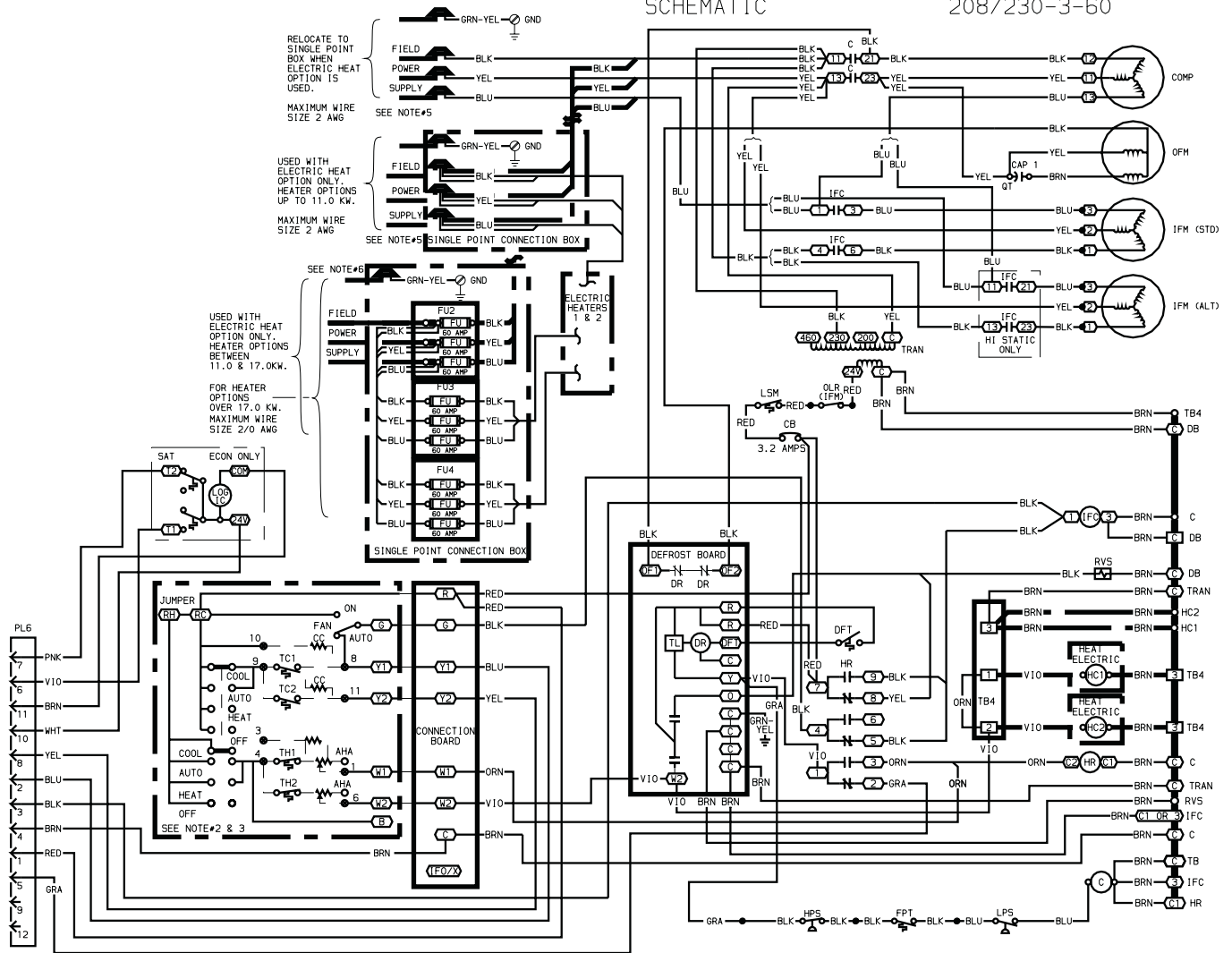
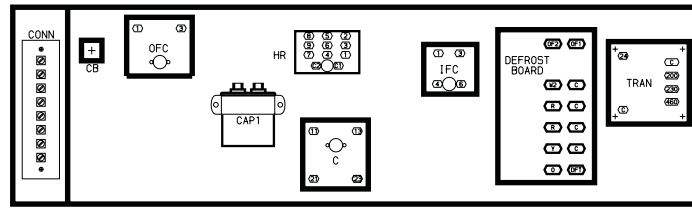


Fig. 8 — Schematic/Component Arrangement; 50TFQ007; 208/230-3-60 (cont)



COMPONENT ARRANGEMENT

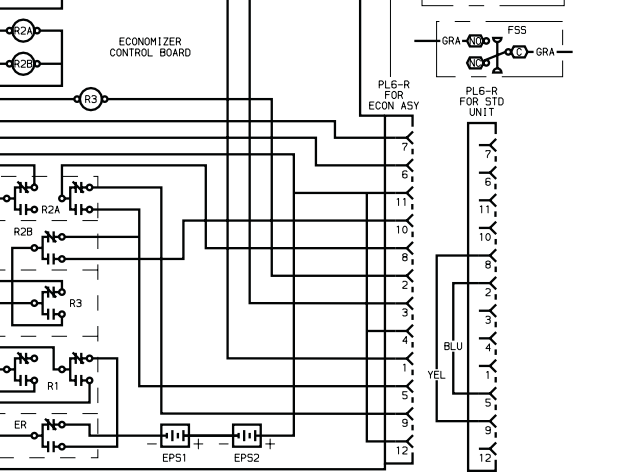
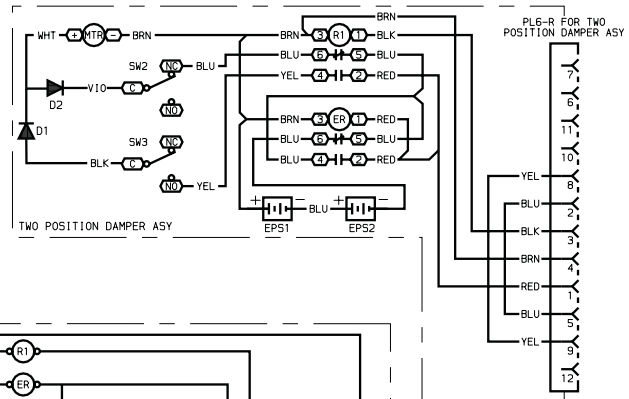
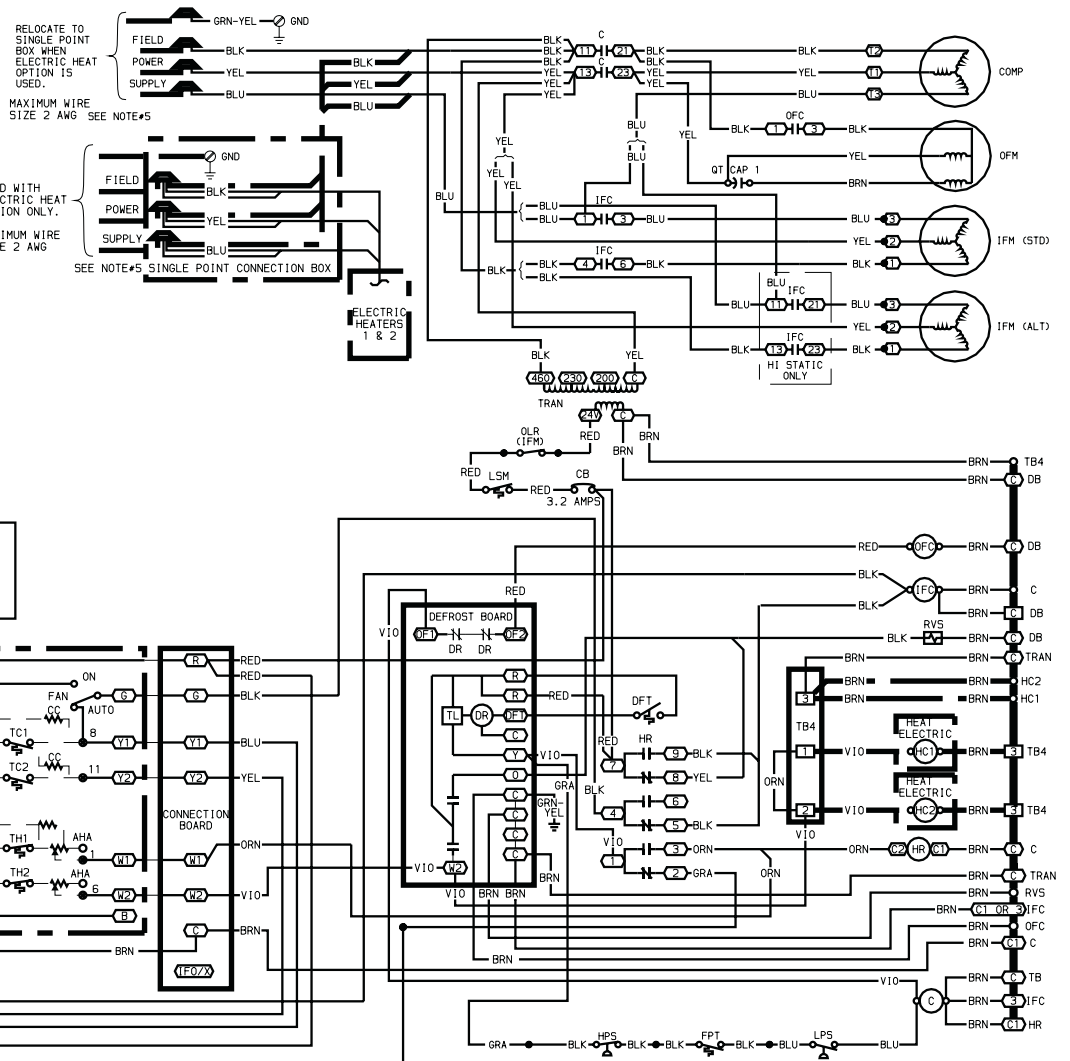
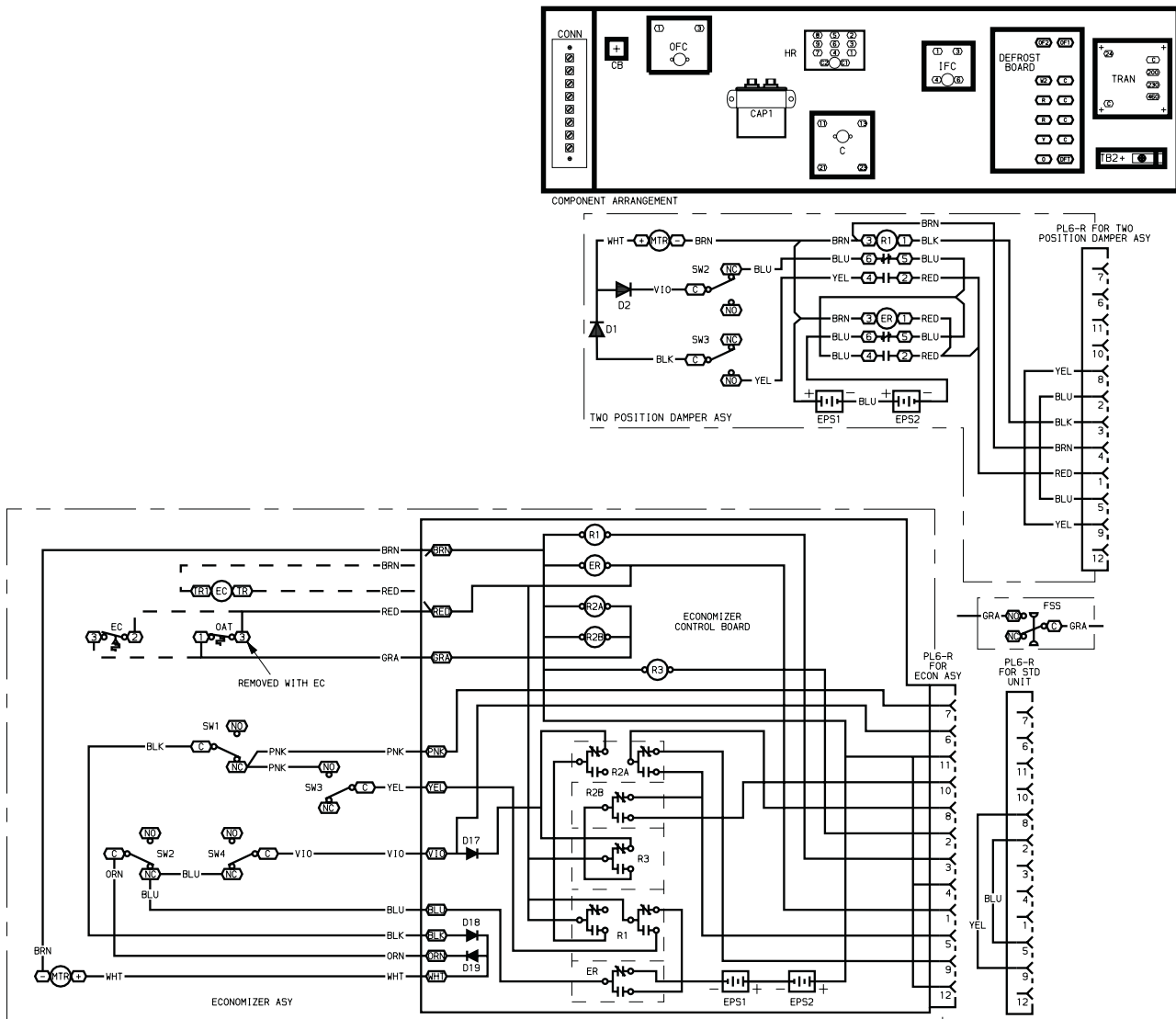
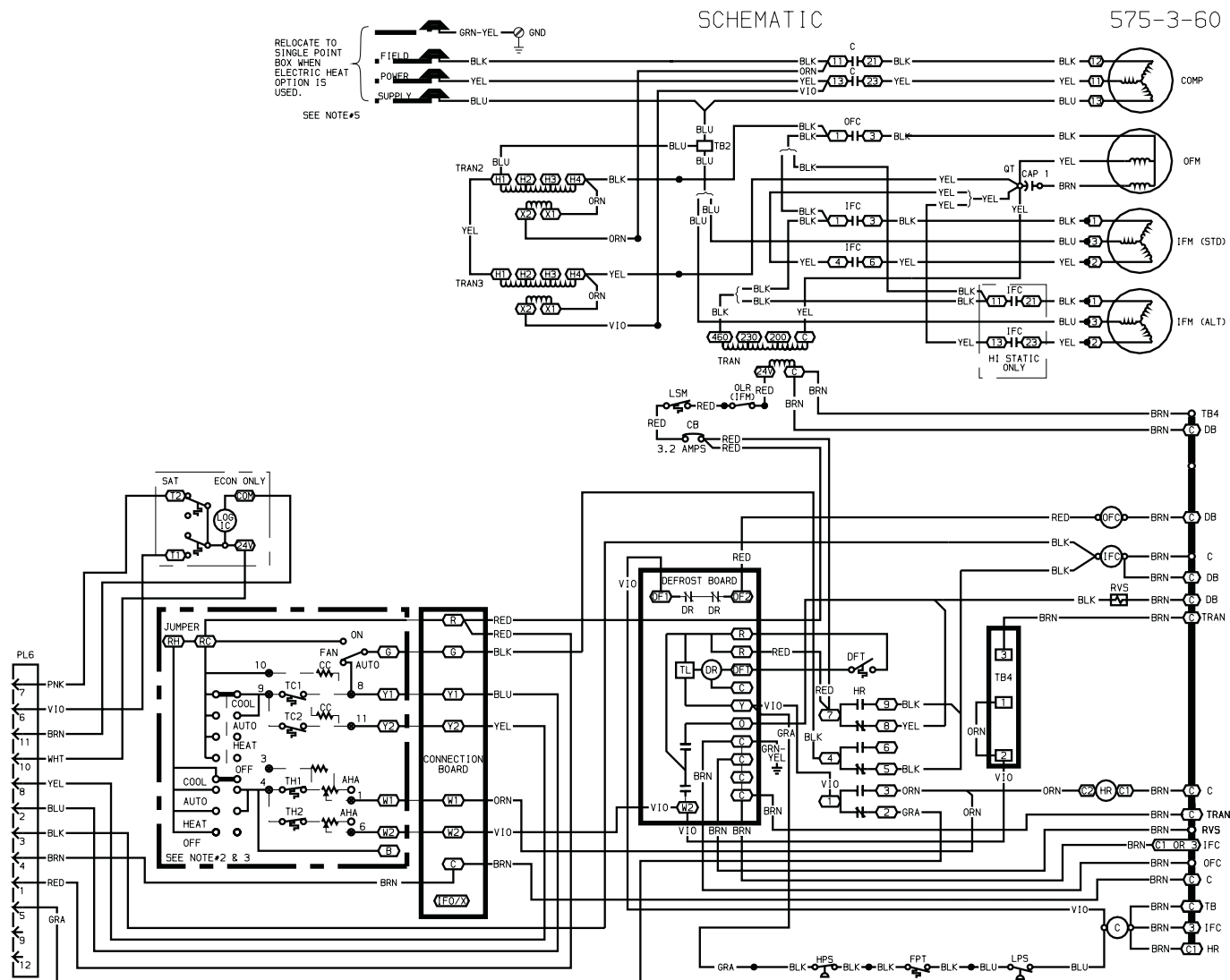


Fig. 9 — Schematic/Component Arrangement; 50TFQ007; 460-3-60

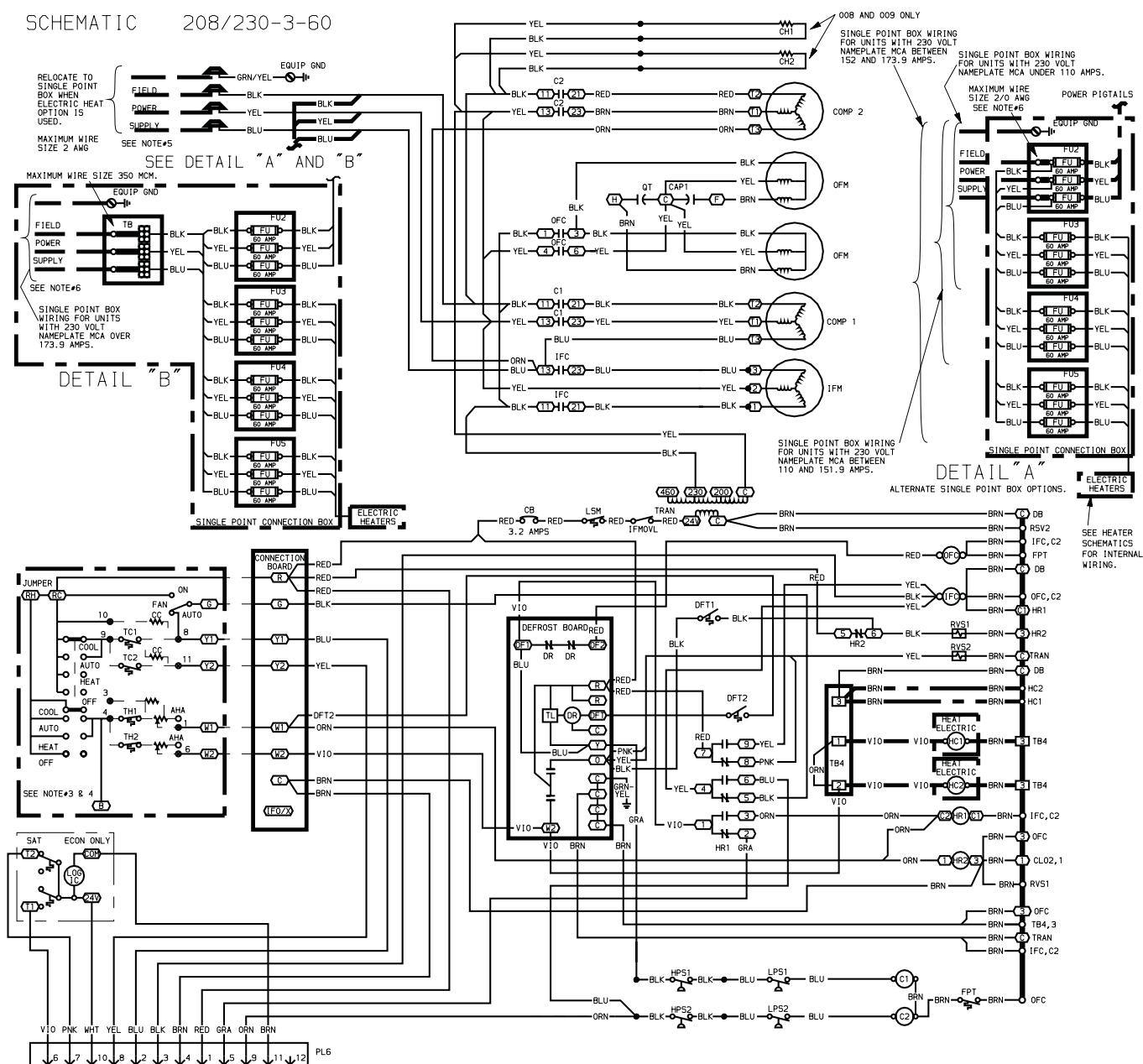


**Fig. 9 — Schematic/Component Arrangement; 50TFQ007; 460-3-60 (cont)**



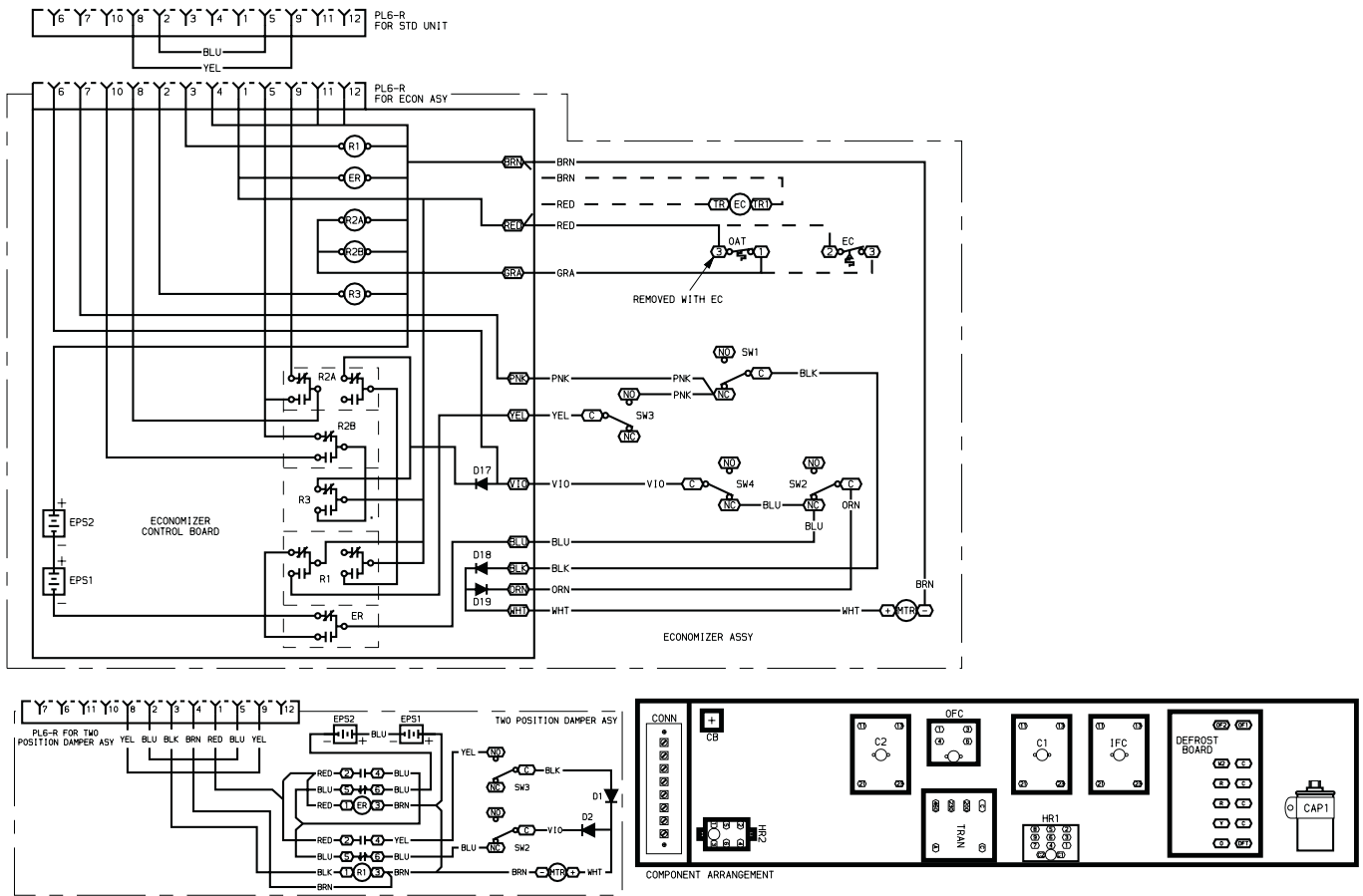


## SCHEMATIC 208/230-3-60



**Fig. 11 — Schematic/Component Arrangement; 50TFQ008-012; 208/230-3-60**





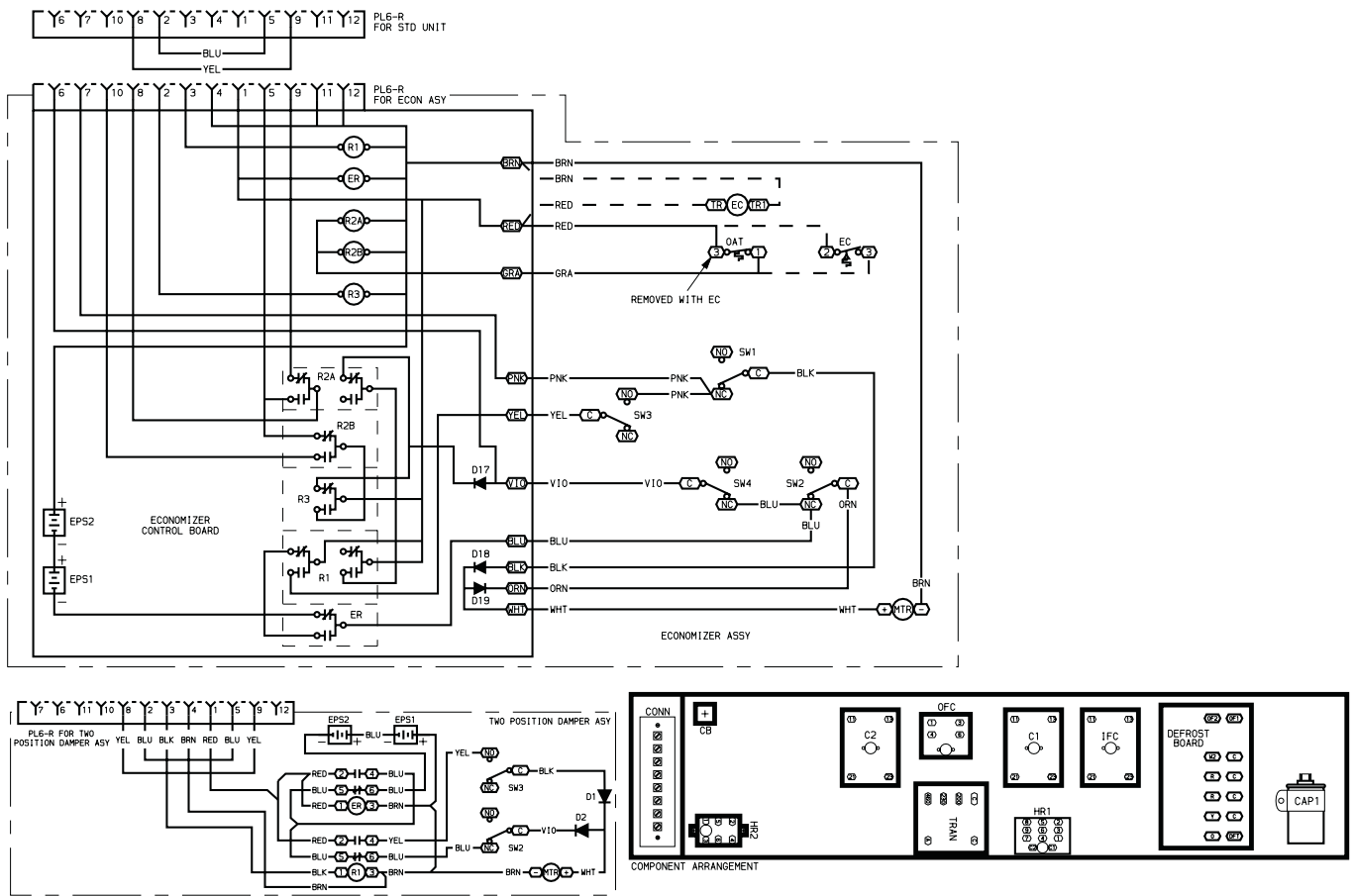
**Fig. 11 — Schematic/Component Arrangement; 50TFQ008-012; 208/230-3-60 (cont)**

The diagram illustrates two wiring configurations for electric heaters:

- Top Diagram (Single Point Box):** Shows a single point box with three terminals: FIELD, POWER, and SUPPLY. The FIELD terminal is connected to a GRN/YEL wire. The POWER terminal is connected to a BLK wire. The SUPPLY terminal is connected to a YEL wire. A separate BLU wire is also shown. The maximum wire size is 2 AWG. A note indicates to see NOTE#5.
- Bottom Diagram (Single Point Connection Box):** Shows a single point connection box with three terminals: FIELD, POWER, and SUPPLY. The FIELD terminal is connected to a BLK wire. The POWER terminal is connected to a YEL wire. The SUPPLY terminal is connected to a BLU wire. A separate BLU wire is also shown. The maximum wire size is 2 AWG. A note indicates to see NOTE#6.

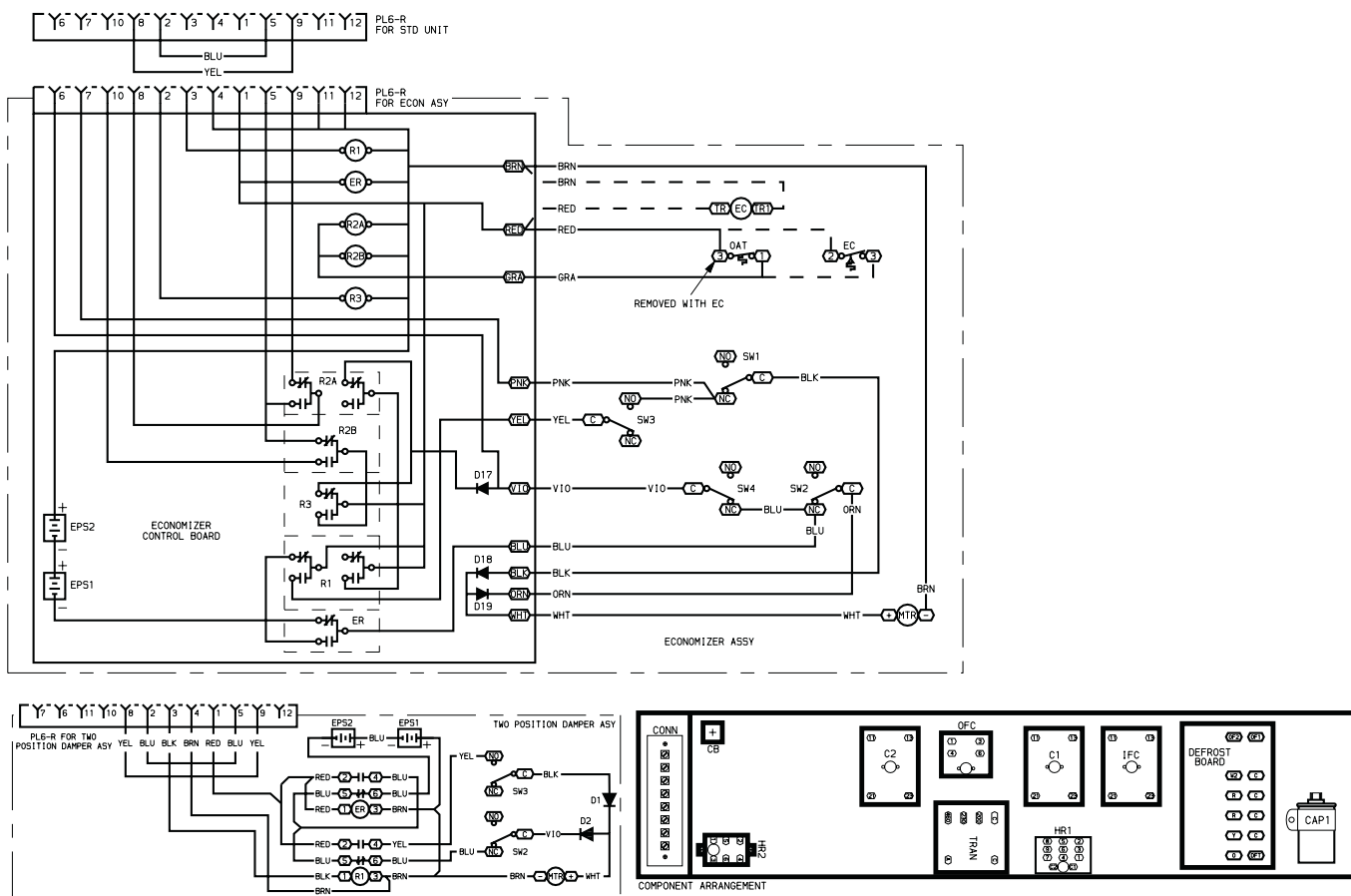
Both diagrams include a common ground connection labeled EQUIP GND. The bottom diagram also includes a note to see DETAIL "A" for additional single point options and a reference to internal wiring schematics for electric heaters.

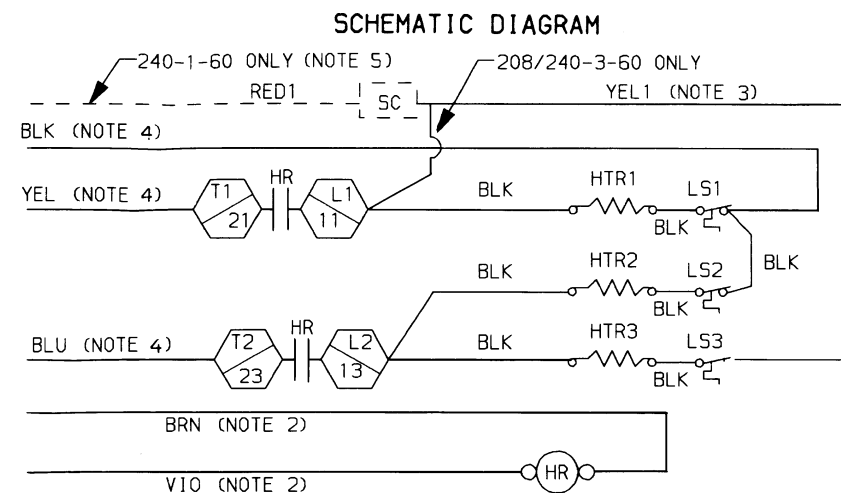




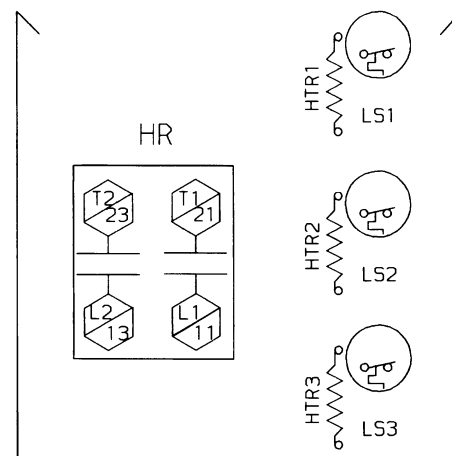
**Fig. 12 — Schematic/Component Arrangement; 50TFQ008-012; 460-3-60 (cont)**







**COMPONENT ARRANGEMENT**



**⚠ WARNING**

Electric shock hazard — Disconnect all branch circuits before removing this cover.

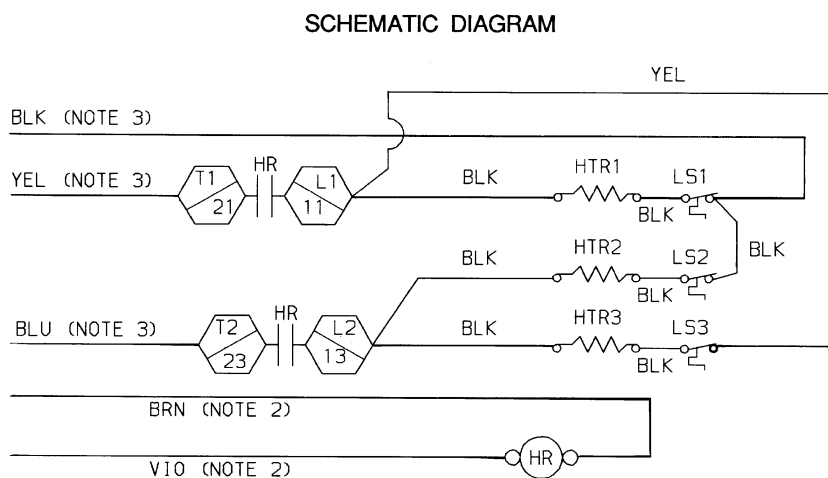
**NOTES:**

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. For single phase, disconnect YEL1 wire from terminal L1/11 and connect RED1 wire and splice connector to loose terminal on YEL1 as shown above.
4. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.
5. For single phase operation, disconnect YEL1 from L1/11 and splice to RED1 with a splice connector.

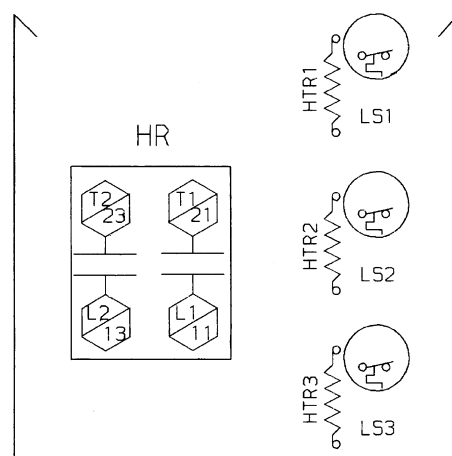
**LEGEND**

- Sylvania Marked Terminal Elmwood
- Unmarked Terminal
- HTR** — Heater
- HR** — Heater Relay
- LS** — Limit Switch
- NEC** — National Electrical Code
- SC** — Splice Connector

**Fig. 14 — Label Diagram, Accessory Electric Heater; 50TFQ004-006; 208/240 V, Single Phase**



**COMPONENT ARRANGEMENT**



**⚠ WARNING**

Electric shock hazard — Disconnect all branch circuits before removing this cover.

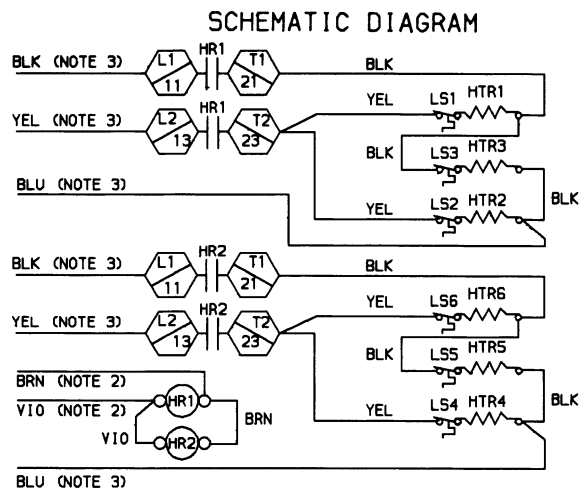
**NOTES:**

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.

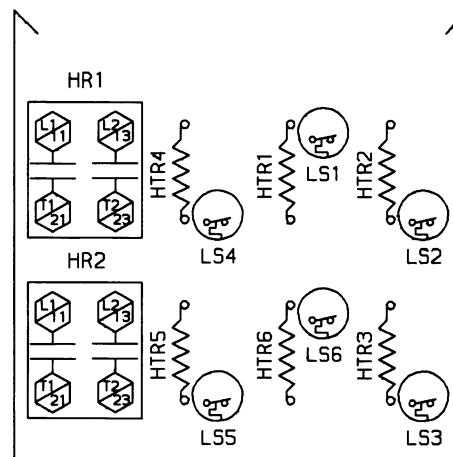
**LEGEND**

- Sylvania Marked Terminal Elmwood
- Unmarked Terminal
- HTR** — Heater
- HR** — Heater Relay
- LS** — Limit Switch
- NEC** — National Electrical Code

**Fig. 15 — Label Diagram, Accessory Electric Heater; 50TFQ004-007; 208/240 V, 3 Phase**



**COMPONENT ARRANGEMENT**



**⚠ WARNING**

Electric shock hazard — Disconnect all branch circuits before removing this cover.

**NOTES:**

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.

**Fig. 16 — Label Diagram, Accessory Electric Heater; 50TFQ008-012;  
18.0/24.0 kW, 24.0/32.0 kW, 31.8/42.4 kW, and 37.6/50.0 kW; 208/240 V, 3 Phase**

**LEGEND**



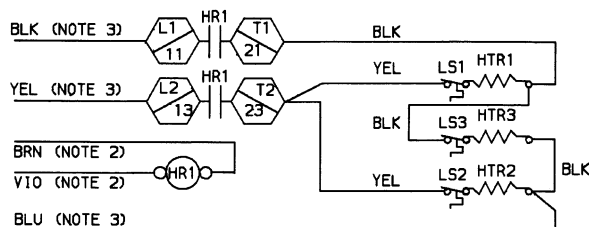
Sylvania  
Marked Terminal  
Elmwood



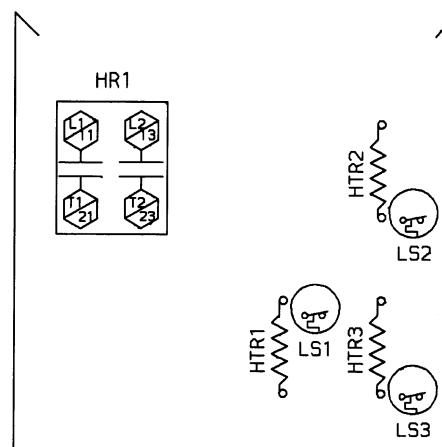
Unmarked Terminal

**HTR** — Heater  
**HR** — Heater Relay  
**LS** — Limit Switch  
**NEC** — National Electrical Code

**SCHEMATIC DIAGRAM**



**COMPONENT ARRANGEMENT**



**⚠ WARNING**

Electric shock hazard — Disconnect all branch circuits before removing this cover.

**NOTES:**

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.

**Fig. 17 — Label Diagram, Accessory Electric Heater; 50TFQ008-012;  
7.8/10.4 kW, and 12.0/16.0 kW; 208/240 V, 3 Phase**

**LEGEND**



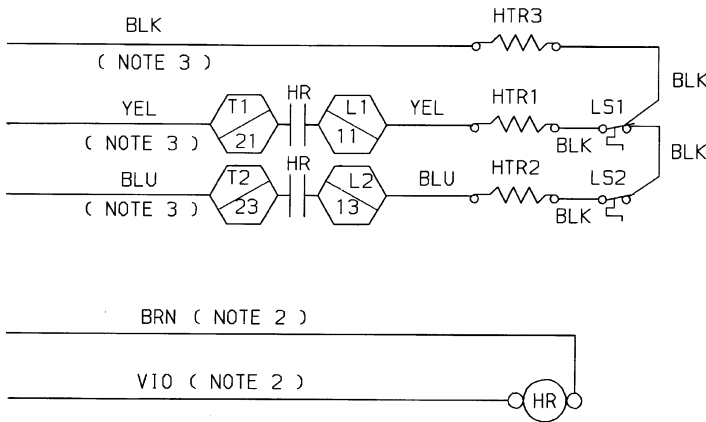
Sylvania  
Marked Terminal  
Elmwood



Unmarked Terminal

**HTR** — Heater  
**HR** — Heater Relay  
**LS** — Limit Switch  
**NEC** — National Electrical Code

### SCHEMATIC DIAGRAM



### ⚠ WARNING

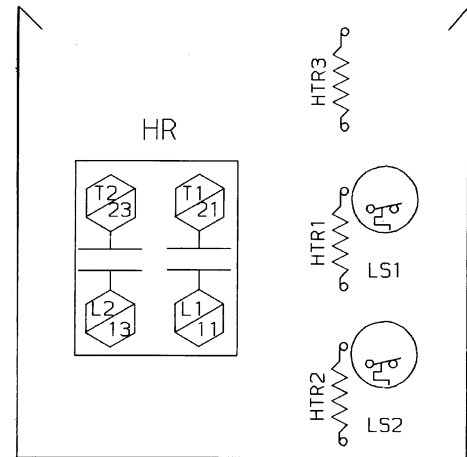
Electric shock hazard — Disconnect all branch circuits before removing this cover.

#### NOTES:

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.

**Fig. 18 — Label Diagram, Accessory Electric Heater; 50TFQ004-007; 480 V, 3 Phase**

### COMPONENT ARRANGEMENT



#### LEGEND



Sylvania  
Marked Terminal  
Elmwood



Unmarked Terminal

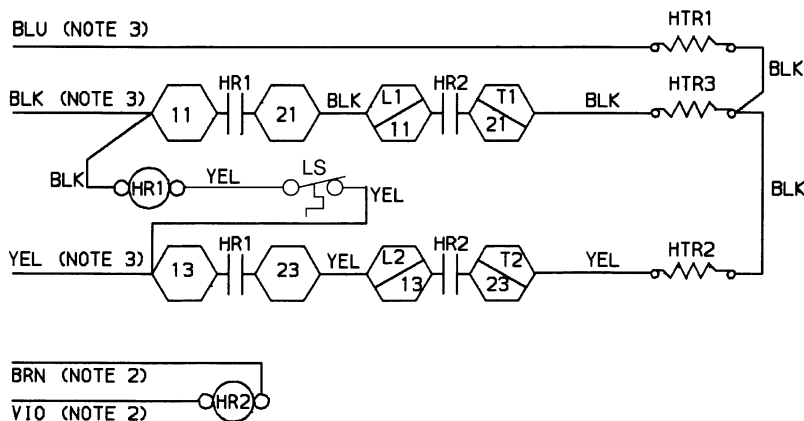
**HTR** — Heater

**HR** — Heater Relay

**LS** — Limit Switch

**NEC** — National Electrical Code

### SCHEMATIC DIAGRAM



### ⚠ WARNING

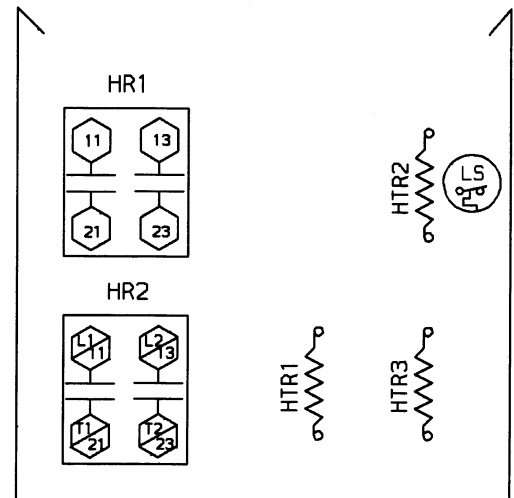
Electric shock hazard — Disconnect all branch circuits before removing this cover.

#### NOTES:

1. To be wired in accordance with NEC and local codes.
2. Brown and violet 24-vac wires are supplied with heater and connected at installation to base unit as shown on base unit wiring diagram.
3. Power wires are supplied with heater and connected at installation to base unit field power connection box as shown on base unit wiring diagram. For field installation of electric heaters, field power connection box shown on equipment nameplate must be used.

**Fig. 19 — Label Diagram, Accessory Electric Heater; 50TFQ008-012;  
13.9 kW and 16.5 kW, 480 V; 17.0 kW, 575 V**

### COMPONENT ARRANGEMENT



#### LEGEND



Sylvania  
Marked Terminal  
Elmwood



Unmarked Terminal

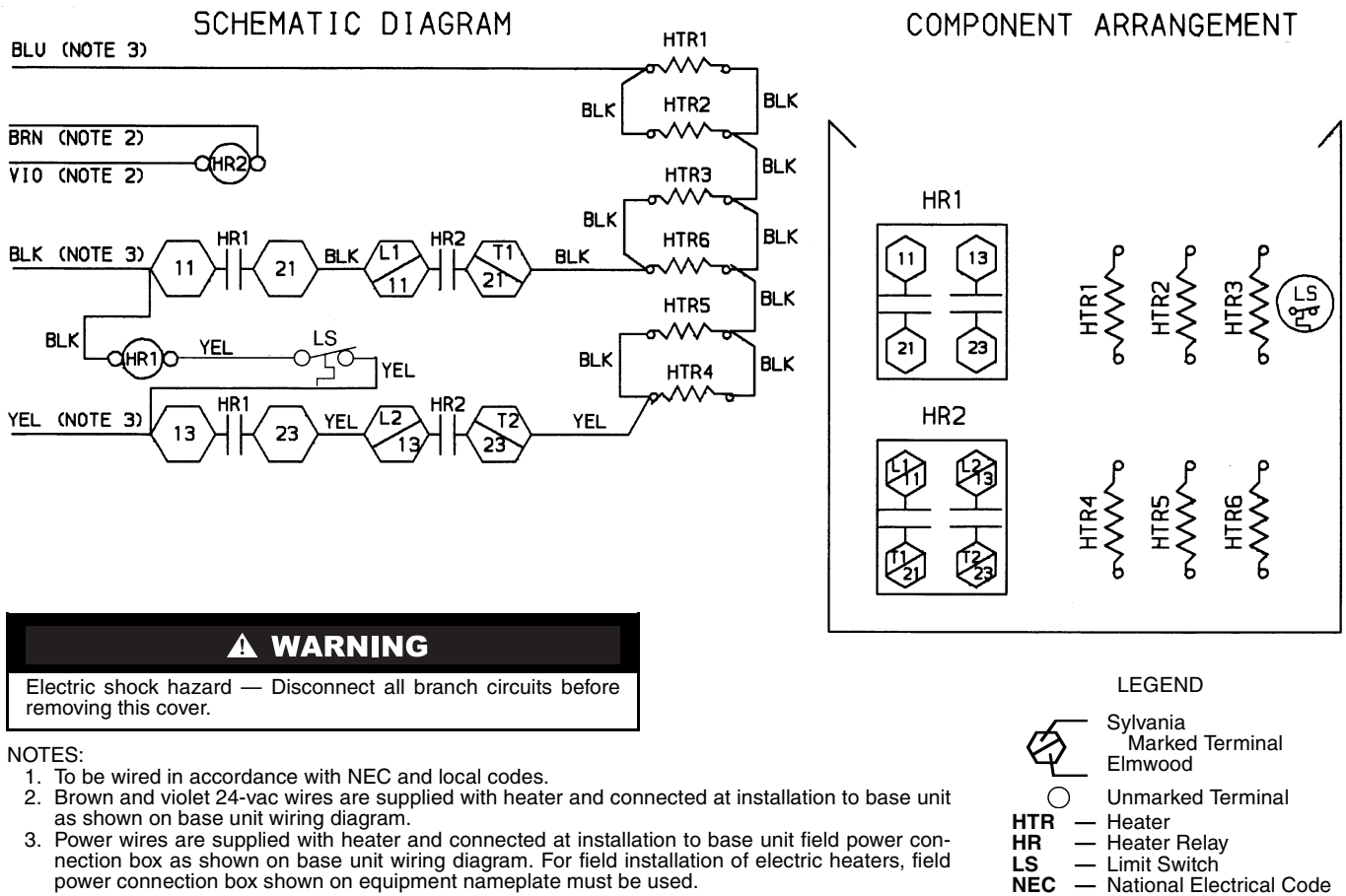
**HTR** — Heater

**HR** — Heater Relay

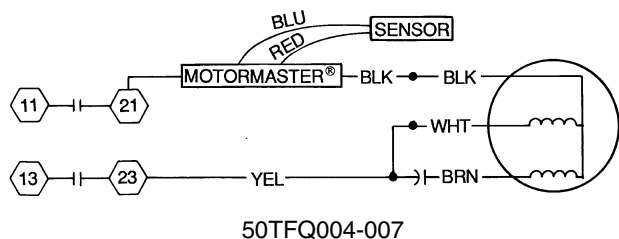
**LS** — Limit Switch

**NEC** — National Electrical Code





**Fig. 20 — Label Diagram, Accessory Electric Heater; 50TFQ009-012;  
27.8 kW, 33.0 kW, 41.7 kW, and 50.0 kW, 460 V; 34.0 kW and 51.0 kW, 575 V**



LEGEND  
C — Contactor

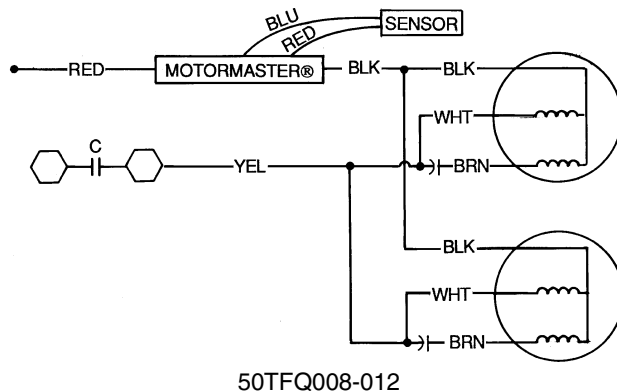
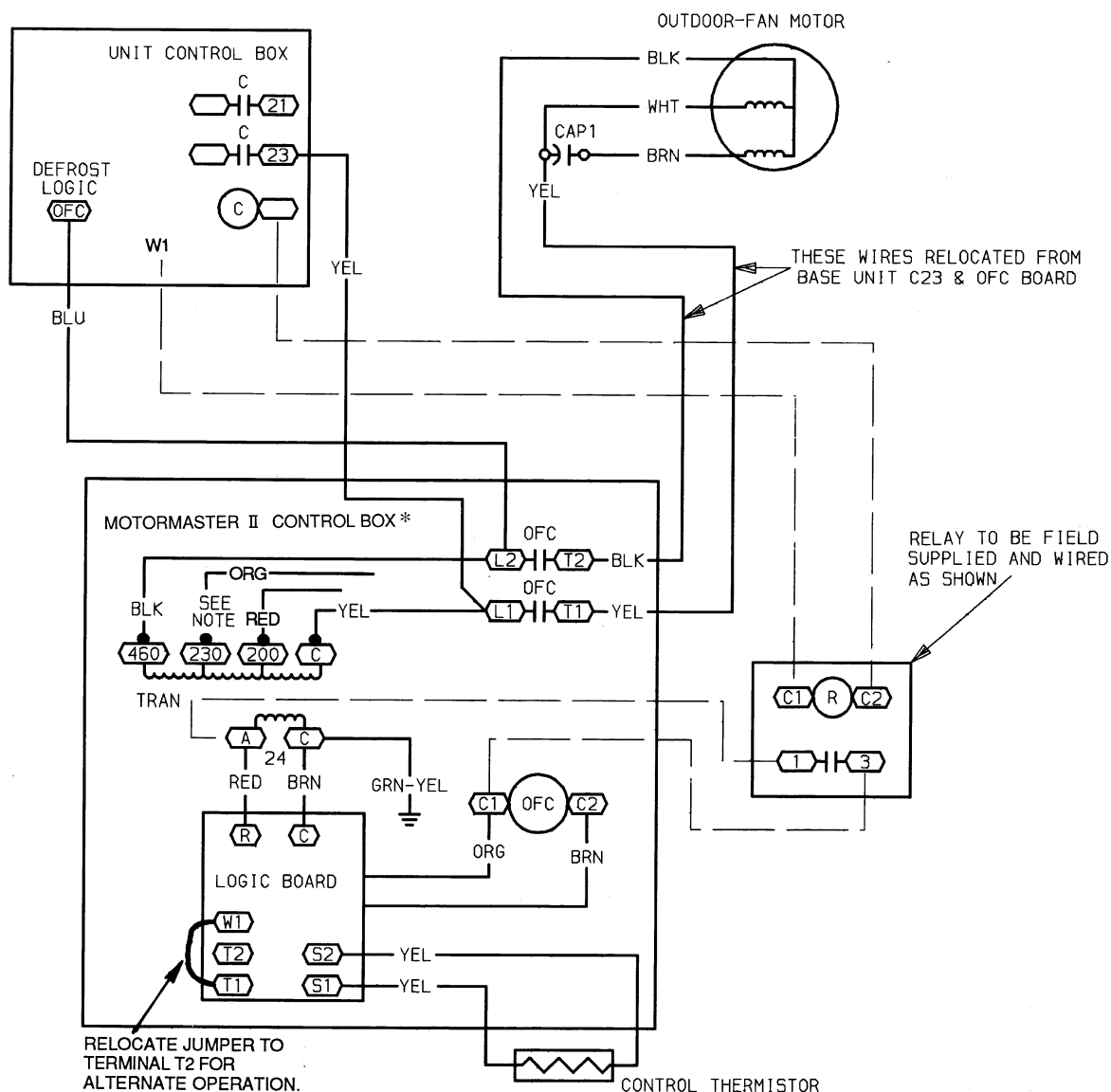


Fig. 21 — Motormaster® I Control Wiring Details



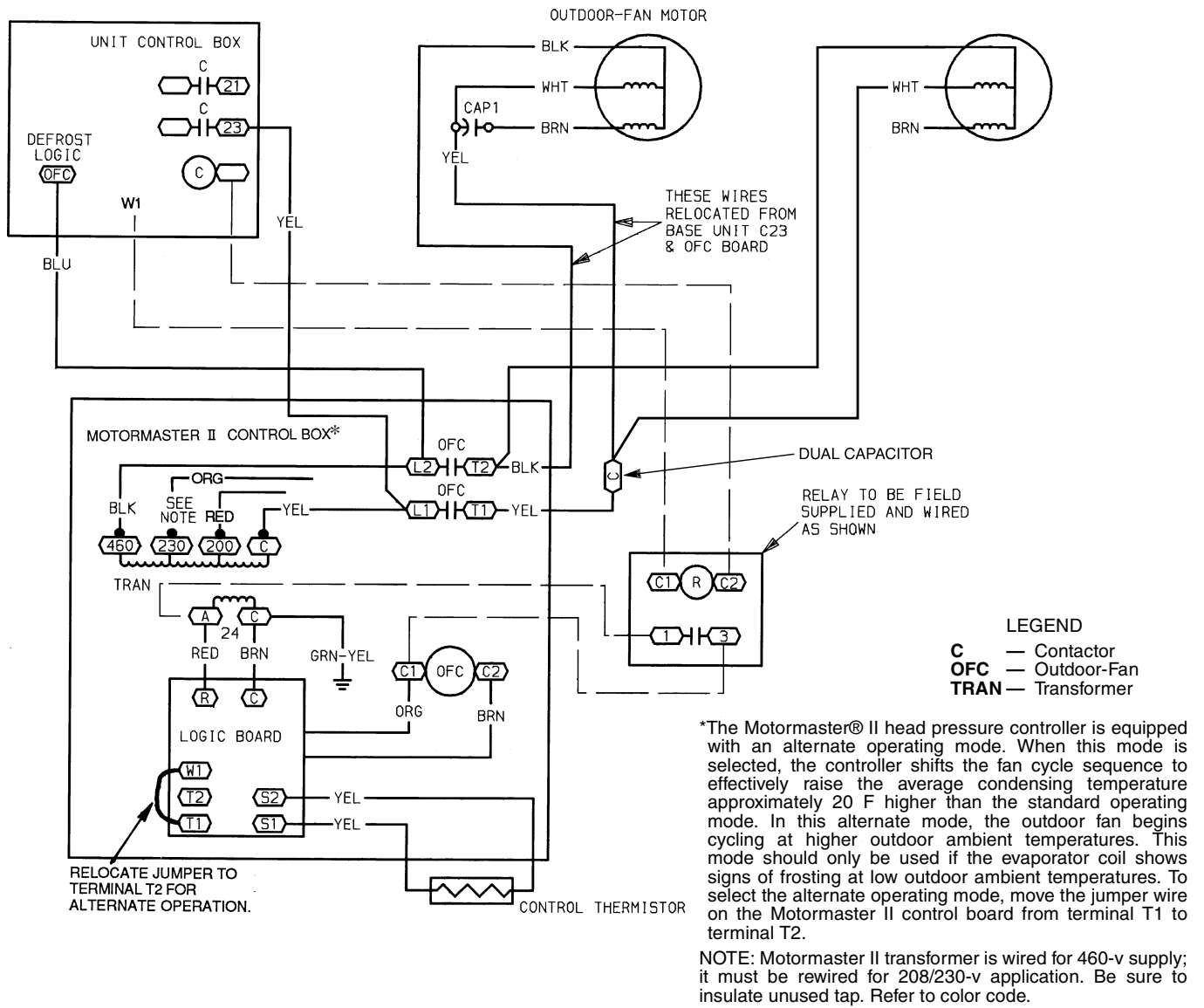
LEGEND  
C — Contactor  
OFC — Outdoor-Fan  
TRAN — Transformer

\*The Motormaster II head pressure controller is equipped with an alternate operating mode. When this mode is selected, the controller shifts the fan cycle sequence to effectively raise the average condensing temperature approximately 20 F higher than the standard

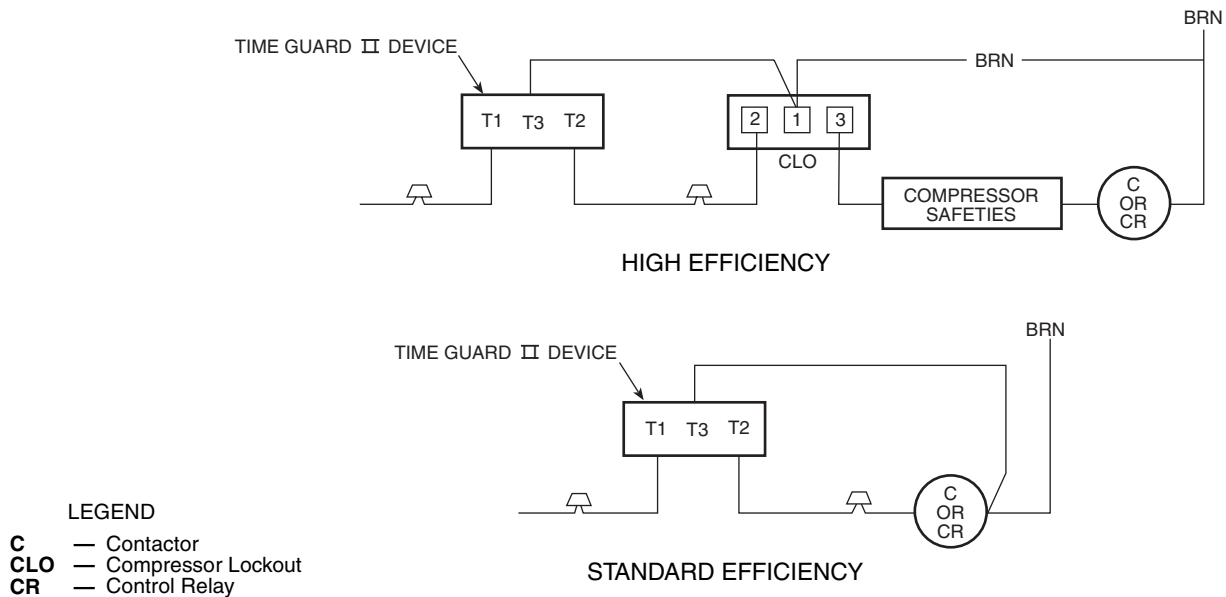
operating mode. In this alternate mode, the outdoor fan begins cycling at higher outdoor ambient temperatures. This mode should only be used if the evaporator coil shows signs of frosting at low outdoor ambient temperatures. To select the alternate operating mode, move the jumper wire on the Motormaster II control board from terminal T1 to terminal T2.

NOTE: Motormaster II transformer is wired for 460-v supply; it must be rewired for 208/230-v application. Be sure to insulate unused tap. Refer to color code.

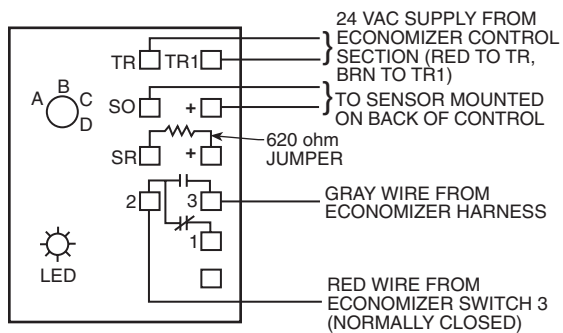
Fig. 22 — Motormaster II Control Wiring Schematic, 50TFQ004-007



**Fig. 23 — Motormaster II Control Wiring Schematic, 50TFQ008-012**

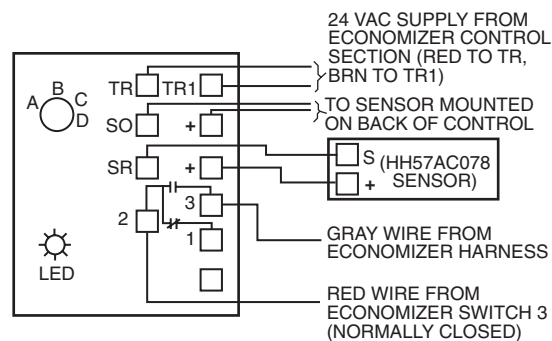


**Fig. 24 — Time Guard® II Device, 50TFQ004-012**



NOTE: Switches shown in high enthalpy state. Terminals 2 and 3 close on enthalpy decrease.

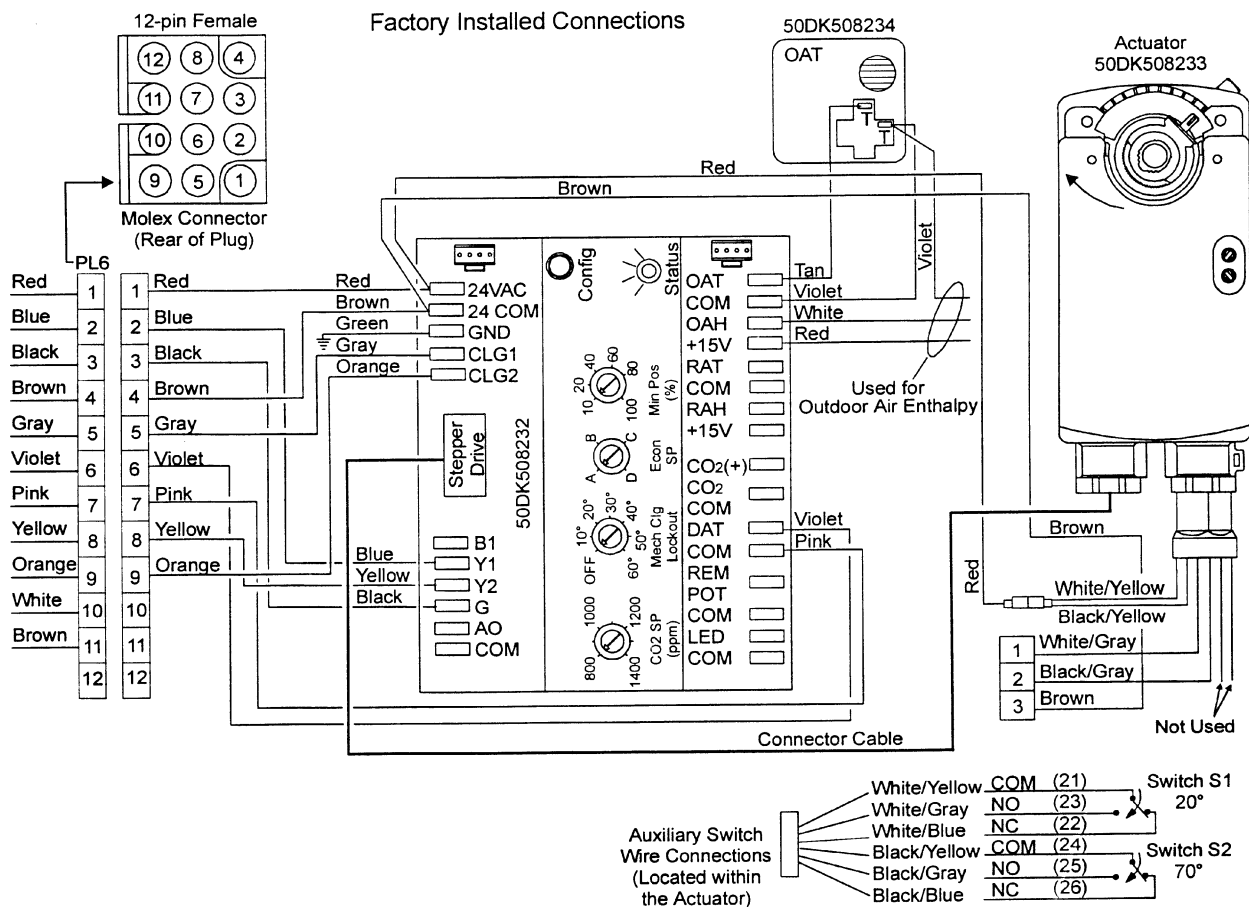
**Fig. 25 — Wiring Connections for Solid-State Enthalpy Control (HH57AC077)**



NOTES:

1. Remove factory-installed jumper across SR and + before connecting wires from HH57AC078 sensor.
2. Switches shown in high outdoor-air enthalpy state. Terminals 2 and 3 close on low outdoor air enthalpy relative to indoor air enthalpy.

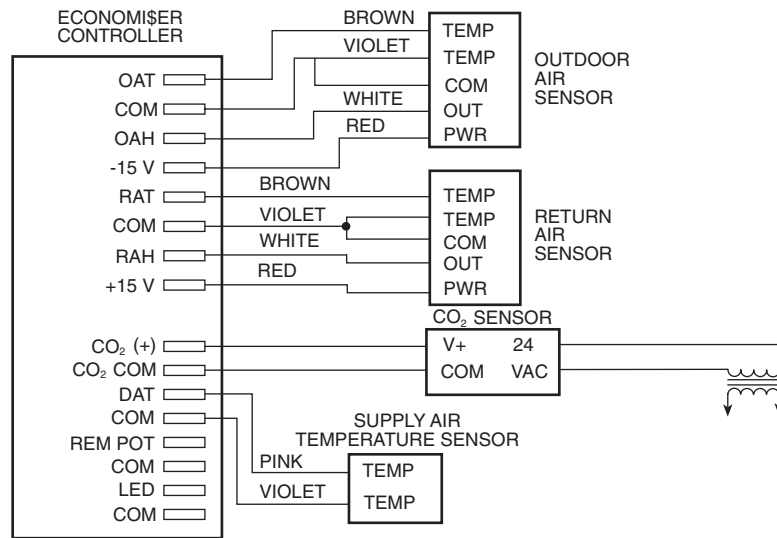
**Fig. 26 — Wiring Connections for Differential Enthalpy Control (HH57AC077 and HH57AC078)**



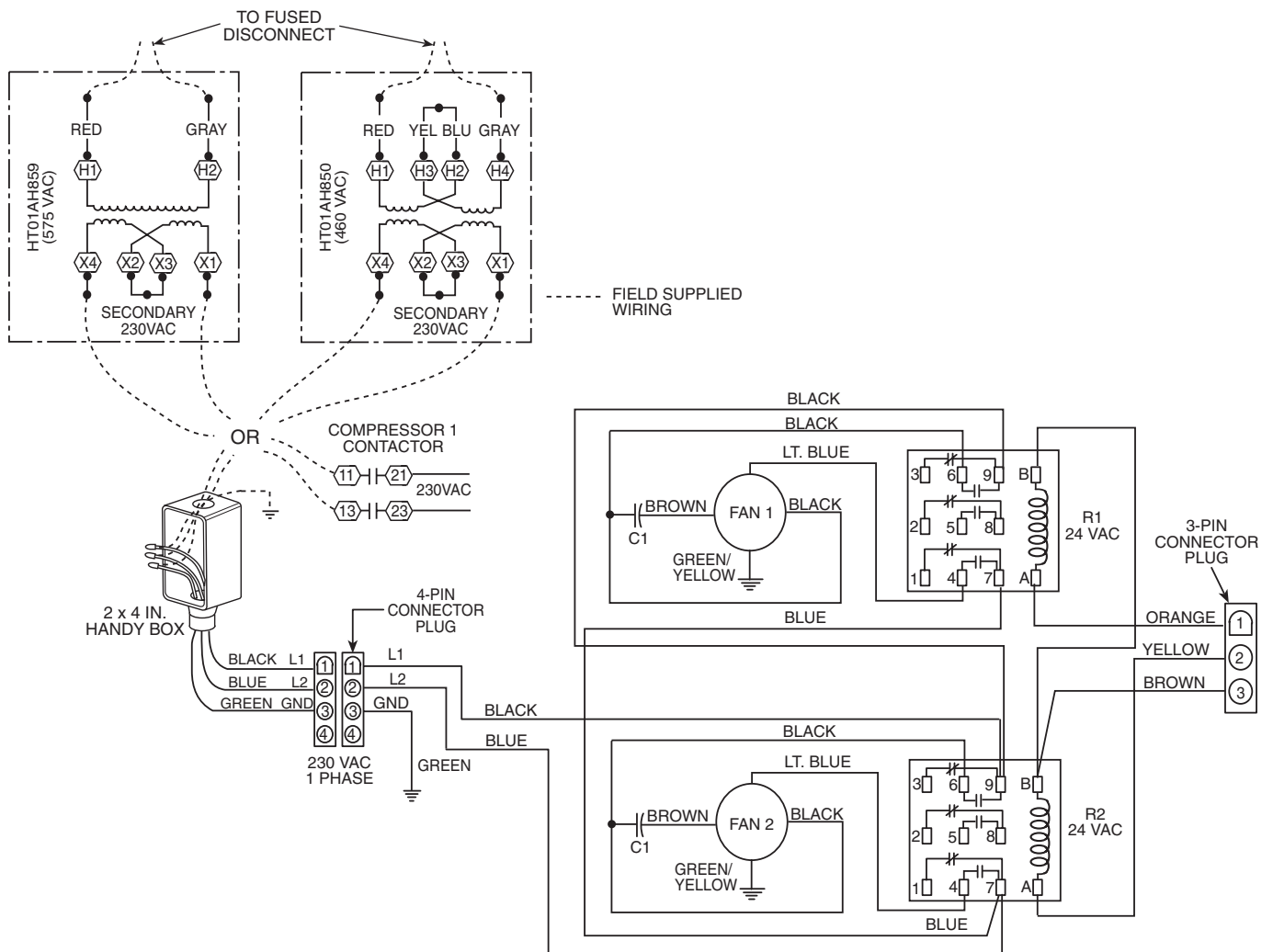
LEGEND

OAT — Outdoor-Air Thermostat

**Fig. 27 — EconoMi\$er Wiring**



**Fig. 28 — EconoMi\$er Sensor Wiring, 50TFQ004-012**



**Fig. 29 — Wiring Diagram for EconoMi\$er Power Exhaust Systems**

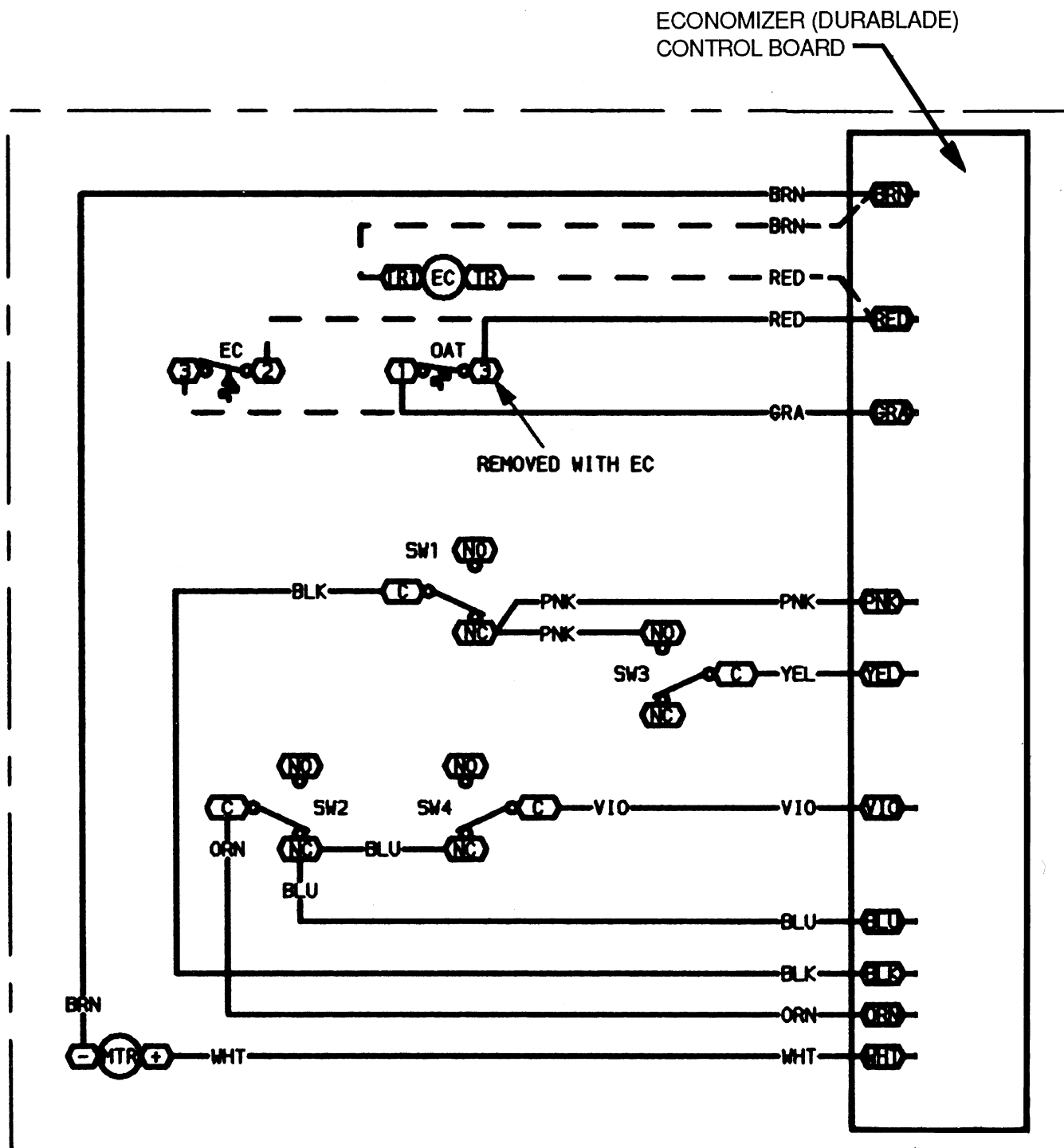


Fig. 30 — Enthalpy Control and Durablade Economizer Control Board Wiring



